The Northwestern Miller.

The Only Weekly Milling Newspaper Published in America.

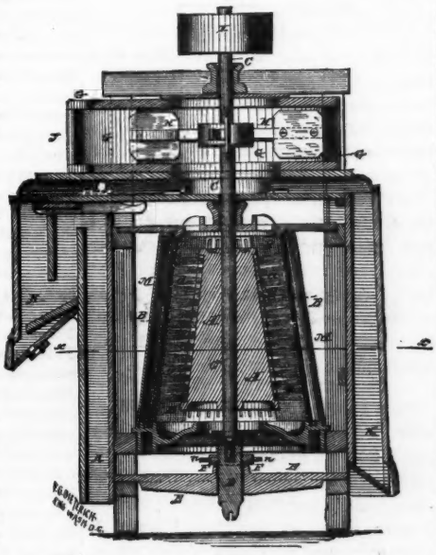
VOLUME 8—NUMBER 12 | MINNEAPOLIS, MINN., SEPTEMBER 19, 1879. | THREE DOLLARS PER YEAR

Galt's Improvement in Smut and Brush Machines for Cleaning Grain—Patented June 10, 1879.

The object of this invention is to provide a combined smut and brush machine, so as to contain in one machine an improved apparatus to remove the smut, and also to scour and polish the grain.

Figure 1 is a vertical section of a machine embodying the invention. Figure 2 is a transverse section of the same on the line *x x* of Fig. 1. Fig. 3 shows two vertical sections of the scouring-case B. Fig. 4 is a side elevation of the inner revolving cone, A. A is a revolving cone, being constructed on its outer circumference of alternate brush and metal vertical sections. The brush sections *a* constitute about two-thirds of the cone surface, and present the usual exterior surface. On the metallic sections *b*, are formed outwardly extending projections or teeth *c*, arranged relatively so as to cover the vertical intervals between each other, so that the grain cannot pass vertically through such teeth. The teeth *c* project nearly or quite to the line of the outer surface of the brush sections *a*, and have their longer diameters horizontally. The upper surface of the teeth *c* is formed concave the full length of the teeth. The function of the teeth *c* is to break the smut-balls and other impurities in the grain, so that such smut and impurities may be blown or drawn out by the fan.

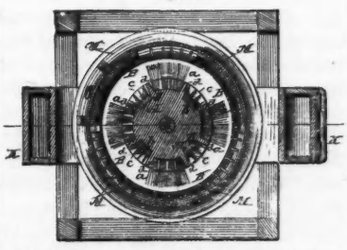
Fig. 1.



The purpose in the above described peculiar construction and arrangement of the teeth *c* is to prevent the grain, as much as possible, from falling while passing through the teeth. The line of direction of the grain over the brush sections is spirally downward, and when it strikes the teeth *c*, by reason of the concavity in the upper surface of the latter, it is thrown diagonally upward to the adjacent brush sections, thus continuing its action on the grain, and preventing it from falling to the bottom of the cone as long as practicable. The grain passes from the teeth sections to the brush sections, and the operation of the latter is to scour and polish the grain, thus removing from the crease and surface of the berry all adhering dirt and smut. On both sides of each tooth section are formed outward flanges *d*, which are intended to extend out nearly or quite to the outer surface of the contiguous brush sections. The purpose in such flanges is to deliver the grain on the outer surface of the brush sections, and thus protect the sides of the brush sections from abrasion by the action of the grain. The cone A may be revolved in either direction by means of the pulley L, placed on the shaft C either above or below the cone.

B is the inner or scouring case, shaped conformably to the cone A, and is constructed of alternate vertical sections of woven steel wire and sheet metal sections having vertical slots, as shown, the sections being bolted together laterally. The design in constructing the scouring-case B of such alternate sections is to provide a resisting surface to the revolving cone which shall not be as harsh as a continuous wire surface, and

Fig. 2.



shall be more harsh than a continuous sheet metal surface, but which in operation shall be a mean between that of both surfaces.

As the revolving cone A in use becomes worn on the outer circumference of its brush sections, the interval between such sections and the case B becomes too great for proper work. To overcome such difficulty and reduce such interval, a vertical adjustment is provided by placing the threaded ring F, having short spokes *n*, on the upper side of the bridge tree E, around the bridge pot D, and cutting a corresponding thread on the exterior of the upper part of the bridge pot D. The threaded ring F supports the bridge pot, and the latter may be made of sufficient length and threaded sufficiently far, so that by turning the ring F the bridge pot, and thereby the shaft C and cone A, may be raised far enough to compensate for all wear upon the exterior of the latter, and until the brush sections are entirely worn away. The metallic sections of the cone A are retired to correspond with the wearing away of the brush sections by removing the necessary proportion of the backing or packing of such metallic sections.

Fig. 3.

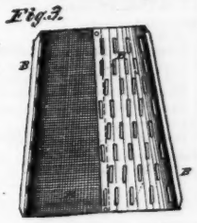
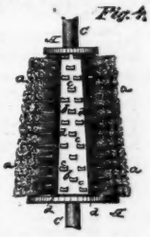


Fig. 4.



The above described machinery is now made by the Eureka Manufacturing Co., Rock Falls, Ills., U. S. A. Manufacturers of the celebrated Becker Wheat Brush, to whom all inquiries or orders should be addressed.

French statistics put down the following as a fair estimate of the amount of grain the countries named will be compelled to purchase this year: France, 114,000,000 bushels; England, 120,000,000 bushels; Italy, 18,600,000 bushels; Spain, 24,000,000 Holland and Belgium, 12,000,000 bushels; Switzerland, 6,000,000 bushels; total, 294,000,000 bushels. On canvassing the wheat exporting countries of the world, the same authorities estimate the quantity available to purchase as follows: United States, 157,500,000 bushels; Hungary, 7,500,000 bushels; India, 12,000,000 bushels; Australia, 21,000,000 bushels; Southern Russia, 30,000,000 bushels; Danubian countries, 6,000,000 bushels; Egypt, 3,000,000 bushels; total, 236,000,000. The estimate for the United States is by far the largest of any year in our history.

Julia Sears, an Iowa girl, has harvested 20,000 bundles of wheat this summer, with no other assistance but her aged father. That is the kind of a girl to be proud of. The old man, by the way, harvested 19,860 of the bundles.—*St. Louis Times.*

Proportion of the Last Crop of Wheat Used by the Millers of Minneapolis.

The following statements made by Secretary Sturtevant, of the board of trade, from the books of the Minneapolis Miller's association and of the several railroad companies whose lines center here, give the quantity of wheat purchased and flour manufactured at Minneapolis from the crop of 1878, commencing September 1st, 1878, and ending August 31st, 1879. The figures are reliable and will be scanned with special interest by residents of this and other states.

WHEAT.

	Bushels.
Purchased by the millers' association outside the city and shipped in by rail	5,330,046
Purchased from teams in the city	469,954
	5,800,000
Purchased by individual millers outside the association limits	410,000
Total purchases by millers	6,210,000
Purchased by outside buyers on the street in the city	37,500
Total purchases	6,246,500
SHIPMENTS,	
There were shipped to different points	240,800
Leaving for milling purposes	6,006,700

There has been less fluctuation in prices than during any former season. The average price has ruled some 15 to 20 cents below the average for three previous years. The highest price paid was 93c for No. 1, from March 3d to March 9th, and from May 13th to June 19th, and the lowest, 76c, from November 15th to November 18th, and from December 6th to December 9th—extreme range 17c per bushel. In 1876 and 1877 the highest price was $1.70, from April 28th to May 3d, 1877, and from May 8th to May 15th, and the lowest was 90c, in July, 1877—range of price, 80c. In 1877 and 1878 the highest was $1.10, in May, 1878, and the lowest 90c, in September, 1877—range 20c. In 1878 and 1879, the price opened September 1st, 1878, at 92c, and closed August 31st, 1879, at 85c. To ascertain the price of No. 2, deduct 5c from above prices of No. 1.

The shipment of flour, the product of the mills, from September 1st, 1878 to August 31st, 1879, was 1,197,530 barrels. Of this, 520,025 barrels were shipped between May 1st and August 31st, 1879. It must be borne in mind that less than four months previous to the commencement of the crop year one-half the milling capacity of the city was destroyed by the great fire, and that in November another twelve-run mill was burned, and in early spring still another was entirely destroyed by fire. Under the circumstances, this showing is most satisfactory. The territory in America in which this flour has been distributed has very largely increased during the year, and to-day there are but few important cities or manufacturing towns in the United States where Minnesota flour is not sold and its merits appreciated. The most important extension of the trade is in Europe. There is not a seaport in the United Kingdom of England, Scotland and Ireland from which orders are not received by Minneapolis millers for flour, and orders are numerous from Germany and continental ports. When the mills now in course of construction are completed, the capacity will be fully double that for the last year.

The shipments of mill stuff from the mills amounted to 35,380 tons. This was largely shipped to eastern markets, principally to interior towns and cities.—*Pioneer Press.*

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Notice to Our Readers.

The columns of THE NORTHWESTERN MILLER are always open to *all* of its readers for the discussion of topics relating to milling. We solicit especially fresh news of fires, failures, new mill enterprises, etc., and always pay for the stamps and trouble.

OSTRANDER, HOPPIN & DEAN,
Minneapolis, Minn.

Our Club List.

In order to meet the wishes of some of our subscribers who have asked us to club our paper with some one or more of the leading Milling and Scientific papers we have arranged with a few of the most important papers. Others will be added to the list as asked for:

	Regular Price.	Club Price.
The Northwestern Miller with		
Scientific American	$6 20.	$5.20.
London Miller (monthly)	4.50.	3.50.
American Miller (monthly)	4.00.	3.25.
The Grain Cleaner (monthly)	4.00.	3.00.

Notice to Advertisers.

The NORTHWESTERN MILLER has double the circulation of any other milling journal published. It is a regular weekly visitor to a large number of the most enterprising and progressive millers and mill owners in the country. In addition to this, a large gratuitous circulation is sent out each week. We have lately made out new and complete lists of the millers, millwrights, etc. in the United States and Canada and shall send a copy of the NORTHWESTERN MILLER to each address at least once a month. *Our rates* of advertising are *lower according to the circulation than those of any other milling journal published.* Address, with copy of advertisement.

OSTRANDER, HOPPIN & DEAN,
Minneapolis, Minn.

ADVERTISERS' DIRECTORY.

NOTE.—Where Advertisements appear "every other week," or "once a month," a blank will be left in place of the page in those issues in which the advertisements do not appear.

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THE International Telegraphic code, of which we made mention last week, takes well among the millers and their agents. Its use cannot prove otherwise than economical, and as the cost of the book is a mere trifle compared with the saving in cost, we do not see why the book should not come into general use.

WE suppose that McFeely, of Union City, Ind., has invented more diamond stone dressing machines than any other man in the country. Two of his machines, the new "Tri-Plate," and the "Improved," took respectively the first and second prizes for the best diamond mill stone dressers, at our late fair, and Mac leaves town happy.

H. J. DEAL, of Bucyrus, Ohio, has evidently struck a pretty nice thing in his flour, grain and bolting cloth inspector, if we may judge from the letters printed elsewhere in this paper.

THE machine shops of the Williams & Orton Manufacturing company, at Sterling, Ill., are crowded with work, and have been all summer. They are running night and day. They have built eight new mills this summer, besides turning out a large quantity of other work.

WE learn from a letter just received from Messrs. Santee & Laird, Alexis, Ill., that their snug little mill was burned at four o'clock A. M., Sept. 15. There was no insurance on the building and but a partial insurance on the stock, so that the loss falls pretty heavily upon them. It is also a serious loss to the town. We trust that Messrs. Santee & Laird, aided by the citizens will soon have another and better mill in the place of the one which was burned.

AWAY back in 1824, early in the history of Ohio, the Hayward Mill furnishing works were started at Cleveland. For over half a century these shops, through various changes of location and proprietors, have been one of the reliable business institutions of Cleveland. The present proprietor, Mr. Geo. R. Gale, bought out the old firm about three years ago and has since steadily increased the amount of his business until he has to-day as good a trade as any establishment of the same size in the country. His advertisement appears in this issue.

THE good people of Durand, Wis., wanted a steam mill in their little city and forthwith made their wants known through the NORTHWESTERN MILLER, the result being that in less time than it takes to tell it, they found Mr. S. J. Burnett, a live mill man, of La Crosse, Wis., at their doors, ready to go to work as soon as the preliminaries were settled. Unfortunately, the heavy storms ruined the crops for this year, and as a consequence the mill project is declared "off." But neither Burnett nor the citizens of Durand have given up the idea and we look to see the much to be desired mill put up there next summer.

WE illustrate this week, a new machine for cleaning wheat, the invention of Jno. M. Gault, president of the Eureka Manufacturing company, of Rock Falls, Ill. This company are well known to the millers throughout the country as manufacturers of the Becker wheat brush. The new machine is designed to take a middle place between smutters and brush machines. While the company will make and sell this machine, they will not by any means cease making the Becker wheat brush, the advertisement of which appears in our advertising columns. They are having a good trade, and we publish elsewhere a list of the parties who have recently ordered their machines.

LETTERS just received state that Jonathan Mills' system of gradual reduction machines put into McKean Brothers' mill, at Terre Haute, Ind., by Chisholm Bros., Chicago, has so far run very successfully. Of course the boys are happy, as they have a right to be.

Wheat Gambling.

The embezzlement by one of the officers of a leading bank in this city, of over a hundred and twenty-five thousand dollars, nearly all of which was lost in dealing in options, has created an intense abhorrence in this community to this species of gambling. The *Pioneer Press* says in an editorial on the subject that the embezzlement is justly chargeable to as vile a gambling den as was ever opened in this city, and

That this gambling den is officered by those who move in the best business and social circles, and is patronized by those who wear the badge of respectability, does not change its wicked and infamous character. Shorn of its endorsement throughout the business marts of our country, and stripped of the false position it claims in our business life by reason of legal recognition in certain states, it is nothing more nor less than the most fatal and destructive form of gambling, all the more dangerous to business and society because of its assumed respectability. Our civil authorities are quick to suppress the ten cent gambling dens of our city, but are, for aught we know, powerless to drive out these gambling hells, more popularly described as "commission houses" or "dealers in options," where the young clerks in banks and stores are led to invest the funds of their employers or stockholders, and where there is too much reason to suppose that many of our business men are reckless enough to risk their business character and fortunes. There is no use of mincing terms in this matter This system of wheat gambling, so common, we admit, in all cities, is the most destructive and dangerous to the business interests of society that could well be devised. It tempts and deceives all, and assuming the form of legitimate speculations draws with its fatal and deadly coils thousands who would shrink from the faro bank or the roulette table. No bank is safe whose employers or customers venture inside the doors of the "option dealer." No merchant but who is liable to be robbed by his clerk so soon as that clerk ventures upon the game of "options."

The system of gambling which the *Pioneer Press* condemns so severely, and with so much justice, is one of the greatest evils to the milling interest in this country. It not only demoralizes markets and renders his business profits uncertain, but it also in many instances fascinates and then demoralizes the miller himself. It degrades a legitimate industry to a mere game of chance and makes no man richer or happier, unless it may be the broker who is engaged. We know that the great majority of the millers of this country would rejoice to see the whole system swept away.

English Agricultural Depression.

One of the peculiar incidents of English farming and one which must heavily handicap the farmer is the system of land tenure and the heavy rents which the tenant farmers are obliged to pay to the landed interest. In this new country where land is so plenty and so cheap that the profit on the first year's crop is often more than sufficient to pay for the land upon

which it is grown, it is hard to realize the extent to which the English farmers are burdened and the great odds against which they have to contend in their competition with the western farmer. One would naturally suppose that with their customers at their very doors they would have the advantage in this competition, for the farmer in America must pay for the long haul to the seaboard, and the three thousand miles of ocean transportation. The cost of doing this is offset by the heavy rents exacted by the English landlords from their tenants. Even in good seasons, there would be reason enough why the English farmer should feel dissatisfied. And now that the past three or four years have brought forth nothing but poor seasons and scanty crops, the causes of complaint are tenfold greater, and in the face of the disadvantages from bad weather and bad laws relating to the tenure of their land, we cannot wonder that the English farmer is discouraged. Our cotemporary, the London *Miller*, in its September review of the preceding month says:

"The month of August, 1879, will be long remembered as the wettest, worst, and coldest of the present generation. It should complete the old English cereal year, and have its hands garnered full with fresh wheat ears, but the hands are empty, and the year is not over. August was the last stake of the farmer, who has played it out and lost. The 1st had some promise, the 31st is without hope. In the annals of agriculture the season has been without a parallel in the last half century, and never in the annals of trade did such a period pass with as little disturbance and alarm as have passed the last few weeks. If an emperor fiddled whilst Rome was in flames, Mark Lane has gone on bargaining without excitement, whilst half a million of farmers' rooftrees were being made desolate by the rains of this later deluge. The quietness of business and the equanimity of opinion in London and Liverpool have been as remarkable as the season. Every twenty-four hours a favorable change to fine and settled weather has been expected, and it was hoped the harvest might be saved at last. But even this straw was denied to the drowning season, that has gone on spoiling two crops at once, the late hay and the corn harvests. Nevertheless the ovens of this kingdom have not turned out a single batch of bread the less because our grain was rotting in the fields. The millers' hopper has been kept filled with wheat from somewhere, and merchants, factors, brokers, agents, by whatever name sellers are called, have always been canvassing for fresh orders at prices that prove there must be sunshine somewhere in the world. August indeed has given to America the favor it has withheld from Great Britain. It has signed and sealed its gift of plenty to the United States; it has raised up a bulwark against scarcity—almost famine—threatened elsewhere. America, this year more than ever, will be the staff of life on which Europe will have to lean. The month of August, therefore, has not failed the world; it has brought its golden store of corn, only it has distributed it niggardly here, lavishly there, impoverishing our farmers, enriching those of America."

It is not surprising that, with the condition of things stated above and the prospect of better lands and more genial skies held out to them, the eyes of English farmers should be turned to America, and that emigration to this country should be largely on the increase. We welcome their coming, for there is yet room in our vast country yet undeveloped for many millions and they cannot come too soon.

Local and Personal.

—Jack Handy, of Northfield, was in town yesterday.

—C. B. Shove, returned from Chicago last Friday night.

—Mr. W. H. Officer, of Austin, was in town last Saturday.

—Charley Knickerbocker, of Jackson, Mich., has been spending the past few days in the city.

—E. Zeidler, of the firm of A. A. Freeman & Co., LaCrosse, was in town for a few hours last Saturday.

—A. E. Barclay, of the Morristown, Minn., mills, made a flying visit to Minneapolis last Wednesday evening.

—Frank Huott has returned from Montevideo, Minn., and gone to Chippewa Falls, Wis., where he has obtained work.

—Mr. B. P. Shuler, of the Arctic Mill, was presented with a gold-headed cane by the employes of that institution, upon his fiftieth birthday.

—Mr. A. L. Miner, of O. A. Pray & Co. has gone on a visit to his old home in northeastern New York, a place he has not visited in twenty-three years.

—Hon. C. C. Washburn has purchased of R. D. Warner 65 feet front by 88½ feet deep fronting on the Minneapolis Mill company's canal, the consideration being $10,000.

—J. W. Owen, the veteran "drummer," having retired from active life, has bought a lot in the village of Niagara Falls and will put up a "tony" residence this fall.

—Mr. Skinner, of the firm of Skinner & Wood, Erie, Pa., has been spending the past few days in this city and has been a frequent visitor at our office. He is always welcome.

—Mr. J. F. Linton, an old mill man, formerly engaged in milling at Toledo, Ohio, and now in the newspaper business at Columbus, Ohio, favored us with a short call last Friday morning.

—They do say that even so good natured and innocent looking a boy as Jim Miller, of the Excelsior, was one of the attendants upon the races, and that he has been rubbing his eyes ever since and wondering why Sleepy Tom didn't wake up.

—Mr. Thos. Heermans, one of the owners of the Star and Crescent mills, Chicago, and Ed. Campbell, who has had charge of the Star and Crescent for so long, have been looking over the milling interest in Minneapolis for a few days past.

—McLean, of Lockport, who has forced every miller he has met this summer to buy from one to a half dozen Richmond grain cleaning machines, thinks seriously of going home to hibernate until warm weather comes again, and promises to leave next Monday.

—The contract for locating the machinery in the new elevator in this city, and starting it up, has been awarded to Messrs. E. P. Allis & Co., of the Reliance Works, Milwaukee, Wis. Messrs. Allis & Co. also have the contract for furnishing the engine, boilers and other machinery.

—Mr. William H. I. Shaw, of the Kilnap mills, Cork, Ireland, who is now on a tour of inspection through this country, looking over the best mills, spent yesterday in visiting the mills in this city. As a matter of course, he rested awhile in our sanctum, and was a very pleasant visitor, indeed.

—A derrick used in handling stone for the St. Paul elevator company's new engine house broke Wednesday morning, letting a large block of stone fall upon a workman named August Moberg. His skull was fractured and other serious injuries inflicted which it is thought will prove fatal.

—Wm. W. Keen, assistant cashier in the Northwestern National bank, is a defaulter in the sum of $135,000. This immense sum was lost in grain speculations. The stockholders of the bank are abundantly able to stand the loss, and the directors have made a twenty per cent assessment to make good the impairment of capital.

—Yesterday afternoon about half past two there was quite a little excitement down on the canal, caused by the burning of a lot of shavings which had been thrown from the City mill, now being finished inside, to the bank of the river back of Christian and Co.'s office. The fire department turned out promptly, as did every body within reach, and the blaze was put out in short order.

—We do not pretend to know much about the mysteries or intricacies of "five cent ante," and so can't vouch for the truth of the story that a certain sandy whiskered vendor of diamond mill stone dressers who has been making this city his head quarters for some time past, was beguiled into the game by a few bad machinery men last Sunday night, and cleaned out of all his personal property, includinging hat, boots and shirt studs. We hope the story isn't true. It is bad enough to get unsuspecting millers to buy diamond machines without being guilty of playing a losing game at draw poker.

New Flouring Mill at Winona.

[Special Correspondence.]

For some time past, in fact ever since the firm of Porter & Mowbray was dissolved, the people of this city have been anxiously watching Al. Mowbray's movements. They knew well enough that he was too much of a miller and had too much vim and enterprise to remain out of the business long, and were sure that he would be in a big mill scheme somewhere. Handsome offers were made to him to remove to other points, and it was feared that the temptation would be too strong even for Mowbray to resist. Of late, however, it has been pretty generally understood that a project was on foot, looking to the erection of a mammoth mill in this city with Al. Mowbray as its presiding genius. The facts have been known to your correspondent for some time, but he is only now free to give them to the public. The negotiations for the purchase of the ground on which the mill is to stand having been satisfactorily completed, I am now at liberty to give to the readers of the NORTHWESTERN MILLER the following facts in regard to the new enterprise:

The new mill is to be built by a stock company, to be called the Winona Mill company, with a capital of $80,000. The incorporators and stockholders in the company are A. G. Mowbray who is too well known to your readers to require further mention; L. R. Brooks, cashier of the Second National bank: Chas. L. Bonner, a leading commission merchant and grain buyer of this city, and C. & R. T. Doud, manufacturers of barrels at Winona, La Crosse, and other points. The mill will be erected on the river bank, below the railroad bridge and just east of the public levee. The building will be of wood covered with iron sheathing and will rest on solid stone foundations. The building will be 75x100 feet, and including the lower story, or basement, will be seven stories high. From the top of the foundation stones, which will be a little above the ground level, to the highest point of the roof, the distance will be one hundred feet lacking four inches. The basement or lower story is to be twelve feet in the clear; the next five stories, fourteen feet each, and the top story will be twelve and one-half feet to the eaves and about sixteen feet in the center.

The mill will be what is now known to the trade as a "gradual reduction" mill; that is, the wheat will be made into flour by several successive reductions. The machinery employed will be of the latest and most approved styles and will include some of Mr. Mowbray's own inventions. Rollers will be used extensively and the mill stone will be left out in the cold. The capacity of the mill will be from eight hundred to one thousand barrels per day. The motive power will be steam, the engine being a compound engine with Corliss valve gear. It will be of 350 horse power. Jack Cross of Minneapolis is making the plans. Work has been commenced and it is expected the mill will start up in about six months.

Winona, Sept. 16, 1879. HAL.

Winona expenses for ensuing year are estimated at $36,850. The Winona Mill company has been organized with a capital of $80,000, and a new five-story mill 800 barrel capacity, will be built.

THE BECKER WHEAT BRUSH.

Read what J. M. Brandt, of Mt. Joy, Pa., and Oliver & Bacon, of Erie, Pa., say about it.

MOUNT JOY, PA., August 8th, 1879.

Eureka Manfg. Co., Rock Falls, Ill.:

Gents: The Becker Brush which I started about four weeks ago is giving entire satisfaction; it is astonishing what amount of fuzz it takes off the wheat, more than I had any idea; after going through two machines first, and good ones. I have one smutter which is as good a scourer as any I ever saw, and the Becker Brush takes as much off after it leaves the smutter as the smutter does. I am very well pleased with it; it runs like a top. Yours truly,

J. M. BRANDT.

Eureka Manufg. Co., Rock Falls, Ill.:

Dear Sirs: We must say that the Becker Brush suits us better from the very start than any other machine we have ever put in; it gave us the least trouble to get started and adjusted. In fact it gave us no trouble at all; but has done splendid work from the start. Our wheat is now much better cleaned than before. In regard to power required, can only say, that the reason we had not put in a Brush long ago, was that we thought we had not the power to spare to drive it, but now that we have got it, our engineer says he can see *no difference in steam or fuel*. Previous to using your Brush, we had frequent complaint, so we feel confident it is doing us good in that way, as well as saving wheat in screenings. There *may* be better machines than yours but we have not seen them.

OLIVER & BACON, Erie, Pa.,

We claim that no Merchant Mill can afford to do without them. We solicit correspondence. Address, EUREKA MANUFACTURING CO., Rock Falls, Ills.

THE INTERNATIONAL TELEGRAPHIC CODE.

For the Use of Flour Merchants and their Agents for the Economical and Secret Transmission of Business Telegrams.

Compiled by W. H. DUNWOODY, formerly Agent for the Minneapolis Millers' Association, Assisted by the Principal Flour Merchants of Great Britain.

The above book is a new and complete Telegraphic Code of 180 pages, printed on first class paper, and bound in a neat and substantial manner, for the use of millers and flour merchants in transacting business in a secret and economical manner with their agents in Europe.

By the use of this code, which has been compiled after months of labor by some of the largest flour merchants in Europe and America, more than 75 per cent of the expense of cable dispatches can be saved, which all must acknowledge to be a very lage item, as frequent communications must pass between shippers and their agents.

It is quite easy for any one using the book, even for the first time, to codify a message correctly, as a very full and explicit explanation accompanies each book, but it will be found that a carefnl study of the code will fully repay the trouble, in the increased economy obtained by an intilligent use of it.

This code has received the endorsement of all the millers who have purchased it, and pronounce it to be the most perfect and comprehensive code in existence. We would respectfully refer you to Washburn, Crosby & Co., J. A. Christain & Co., and C. A. Pillsbury & Co., or any and all of the principal millers of Minneapolis; also to E. O. Stannard & Co., St. Louis, and Wade, Bassett & Co., Boston.

Price $3.00. Sold only by the publishers. Orders from abroad promptly attended to.

C. A. MITCHELL & Co., Publishers,
P. O. box 35, Minneapolis, Minn.

Coplin's Improved Corundum Mill Stone Dresser.

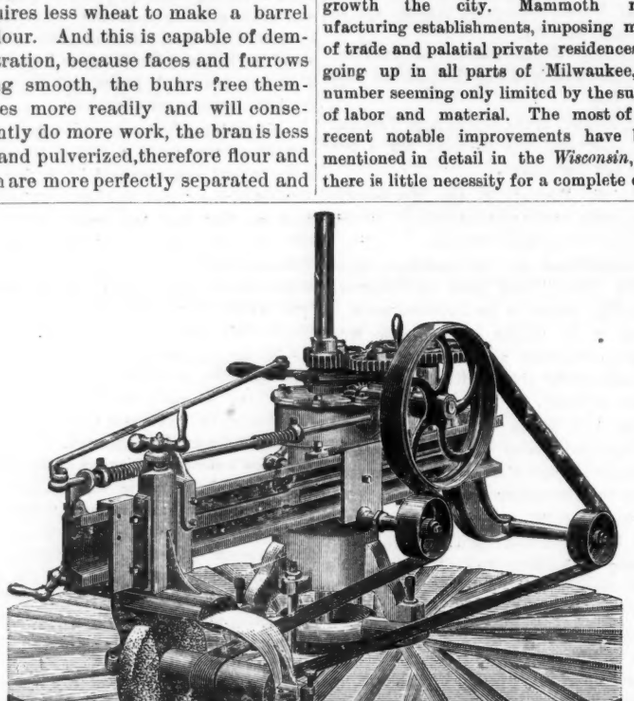
It is now over six years since the NORTHWESTERN MILLER first called attention to the importance of having a perfectly smooth, true surface both on face and furrows of a pair of buhrs, in order that the best results may be attained. At that time it was held by all millers that "cracking" was of prime necessity, and that a mill stone could not be made to work properly unless it was "made like a file," with a pick. At the present time, however, after a long season of careful experimenting, millers, with scarcely an exception, agree that "cracking" is injurious, and that the principle of granulation by means of smooth surfaces so often advocated in the columns of the NORTHWESTERN MILLER is the only true one, at least so far as the mill stone is concerned.

As a consequence of this conversion to the smooth surface theory of granulation, there have been a number of machines invented to accomplish the desired end, viz.: the production of a smooth, true face. Among these machines is that invented by W. Coplin, since deceased, and now assigned to W. Coplin, of Cannon Falls, Minn., and manufactured by him and Mr. E. Vose, of Hastings, Minn. The machine is so plainly shown by the accompanying illustration that any detailed description of it is unnecessary. The machine is clamped or fastened to the stone by two bolts and is trammed by set screws so that the extending arm shown in the cut will swing round perfectly true with the face of the stone. The arm is attached to a sleeve, which is bored out to fit nicely on the central standard, so that there it no lost motion and the arm is made rigid. The machine is driven from the mill spindle or from any convenient upright shaft, and can be operated by any miller of ordinary intelligence and skill in the use of machinery. The machine can be changed to dress furrows on stones running either with or against the sun. The tension of the belt is not affected by raising or lowering the wheel. The machine can be oiled and moved around to different positions on the face of the buhr without stopping it. It is a substantial, durable and well-made machine and not liable to get out of order. In their circular, the the manufacturers say:

"The machine makes a true, smooth face or furrow, either of which will "staff," leaving a solid surface and natural grit. The furrows can be dressed wide and shallow at the skirt and deep and narrow at the eye, or *vice versa*, as required. Another important feature is that it better than any staff in existence to true the face of the buhr; if the stone is winding or has any high places, it shows where it is and how much it is, it is all that could be desired for a face tester, better than any tram staff or circular proof staff in existence.

We claim by dressing with the machine, over dressing with the pick, by reason of a smooth furrow, thus making a free passage between the stones and through the furrows, that it adds to the quality of flour and to the capacity of the buhrs thus dressed, and requires less wheat to make a barrel of flour. And this is capable of demonstration, because faces and furrows being smooth, the buhrs free themselves more readily and will consequently do more work, the bran is less cut and pulverized, therefore flour and bran are more perfectly separated and less bran going with the flour and less flour going with the bran, therefore adding to the quality and quantity of flour from any given amount of wheat. Again, what two men would do in a week with picks, one man with the dresser will do in two days, thus saving four days work of buhrs to owner of mill, and eight days' work of wages of men. To recapitulate, it saves over dressing with picks two-thirds of the time that the mill would be required to lie idle, whilst dressing with the pick, two men working and two-thirds of the expense for labor. Also adds the capacity of buhrs thus dressed and to the quality and quantity of flour from a given amount of wheat. For further particulars address,

N. COPLIN, Cannon Falls, Minn.
E. VOSE, Hastings, Minn.



Coplin's Improved Corundum Mill Stone Dresser.

General Duryea, the famus colonel of the famus regiment, is the leading dealer in fancy woods. He has just introduced into New York, from Mexico, the largest log of mahogany ever landed. It is thirty-two feet long, three feet square, and weighed over seven tons, and the cost of the log was $1,000. In all New York there was but one mill, and that David Reid & Co.'s, where the log could be cut up. The manner of sawing is peculiar. Two long flexible saws gird two circular wheels, and move with the velocity of light. The size of the log and the method of cutting it up attracted a great number of the business men of the city.

Notable New Milling Enterprises to be Established in Milwaukee.

In their perambulations around the city, *Wisconsin* reporters behold evidences on every hand of the steady sure growth the city. Mammoth manufacturing establishments, imposing marts of trade and palatial private residences are going up in all parts of Milwaukee, the number seeming only limited by the supply of labor and material. The most of the recent notable improvements have been mentioned in detail in the *Wisconsin*, and there is little necessity for a complete enumeration. The magnificent chamber of commerce, the new Angus Smith elevator, the extensive machine shops of the St. Paul Railway company in the Menomonee valley, the new insane asylum, John Plankinton's magnificent structure on Grand avenue between Fourth and Fifth streets, the hospital building at the Soldier's Home, the Government bonded warehouse, and the Steam Supply company's building on Market street, are a few of the larger building enterprises, and these citations are enough to bear out the statement that Milwaukee is growing somewhat.

An improvement that has escaped attention until the present time, however, is in progress on the South Side, that will add largely to the growing importance of Milwaukee's manufacturing interests. A prominent business man, whose name is withheld upon request, has acquired a piece of land 150 feet in depth on the south side of Washington street and west of the C. and N. W. R. R. On this tract the Milwaukee Middlings Millstone company are now erecting what will be one of the most complete milling establishments in the country. The main building will be 50x80 feet, six stories in height, and constructed of brick. The engine and boiler house, the latter also of brick, will be 50x48 feet, with a brick chimney 100 feet high. The entire machinery in the mill will be driven by a Corliss condensing engine, of 500 horse power, and of the latest and most approved pattern. All of the machinery in the mill is to be furnished by the Milwaukee Middlings Millstone company, and will be such as can be adapted to the system known as the "patent process" of that company, which claims to have originated the idea.

Work on the building was commenced August 11th, and the contract asks for its completion by November 15th. The mill will contain forty-five run of stone, and every essential to a first-class institution. The building will cost when completed, $35,000; the engine will cost $10,000; boilers $4,000. The other necessary machinery and apparatus will bring the cost up to $80,000. It is expected that it will be in operation by the first of January next, and will have the capacity to turn out five hundred barrels of flour daily.

A stock company is now forming for the purpose of putting up still another large flouring mill, that shall be in every respect the most complete that can be devised in accordance with the best knowledge of the art of milling that the present time affords.

The success that has always attended wherever the system of the Milwaukee Middlings Millstone company is used, has been so signal, that the "patent process" of manufacturing flour is fast becoming general in the larger cities.

Should the required amount of stock ($150,000,) be secured, as is probable it will be, work on the proposed mill will be immediately commenced, and will make the third addition to that portion of Milwaukee's manufacturing interest within the year.—*Milwaukee, (Wis.), Evening Wisconsin.*

A Great Wheat Region--The Fresh Fields of the North Pacific Slope.

The steamboats daily arriving here from the Upper Columbia river come loaded down with grain. The agricultural products of of the upper Columbia region, increasing as they have been year by year, will be much greater this season than they have ever been before. This is especially true of wheat, which is the leading staple cereal of this section of the country. From Walla Walla, in Indian Territory, whose surplus products come this way, highly encouraging reports are constantly coming in. Harvesting has been in active progress in that locality for several weeks, and some of the farmers have run extra gangs of reapers during the brilliant moonlight nights. The yield per acre ranges from twenty-five to sixty bushels. Many farms will average forty bushels to the acre, and a few as high as fifty. As it costs less than $2 per acre to plow, seed, and sow, about $1.25 an acre to cut and head, and about seven cents a bushel to thrash and sack, including wages and board to the hired help and feed for horses, the profits of the farmer amounts to a very handsome thing. After retaining enough for the home consumption, Walla Walla will send away a surpluss of not less than 1,500,000 bushels. Equally good reports have been received from the various settlements in eastern Oregon, so that the anticipations which the farmers had indulged in long before the harvest time have been realized. In western Oregon, which is the section of the state between the coast range and the Cascade Mountains, the total yield may fall a little short of the usual average, owing to rust in some of the spring wheat fields that were planted late; but there, as elsewhere, the winter pheat is very fine, and the aggregate production of Oregon and Washington will be enormous, considering the number of acres sown. This year's wheat crop of Oregon alone is estimated at about 10,000,000 bushels. Relatively speaking, in view of the limited population, this is remarkable; and, if Oregonians would but admit it the indications that come from Washington Territory point to results that are still more wonderful.—*Portland Cor. N. Y. Times.*

A Model Mill.

Perhaps there is not a flouring mill in the state, that is so complete in all its details as is the Oxford Mills, C. N. Wilcox, proprietor, and which are situated on the Little Cannon river about two miles from this village. We paid a visit to the mill a few days ago, and viewed it from bottom to top, and we must say that we were very favorably impressed with it.

The main part of this mill was built in 1878, is constructed of stone, and is four stories in height, and is 42 feet by 54 feet, as regards size. Then, in order to facilitate matters in low water, it was found necessary to place steam fixtures in the mill. For this purpose an engine house was put up this season, which is one story high, and 32 feet by 32 feet in size. In this there has already been placed a large boiler, and an engine of 72 horse power will soon be ready to run, probably in a couple of weeks. This machinery is only to be used when the water is short.

The motive power is furnished by a 35 inch Leffel water wheel, and the power is communicated to the machinery by the means, of belts, instead of gearing. The mill has four run of stone, and from the foundation to the roof is most solidly constructed, everything being placed on a stone foundation, thereby ensuring a sureness and steadiness of movement to the machinery, which is very essential in manufactories of the kind. The machinery is of the most modern and approved make and pattern.

Mr. Wilcox has spent his whole life in the flouring business and since he commenced the erection of his present mill, he has spent a great deal of time and money in the enterprise. He now has the satisfaction of owning one of the best small flouring mills in the state. His flour is par excellence and commands a ready sale in the market. Pluck and energy are the characteristics of Mr. Wilcox and it is exemplified in all his business operations.—*Cannon Falls, (Minn.) Beacon, Sept.* 12.

The Time to Sow Winter Wheat.

[Pioneer-Press.]

FORT ATKINSON, Ia., Sept. 11.—In reply to the inquiry of J. W. McClung, about winter wheat, in the *Pioneer-Press* of September 10th, 1879: The best time to sow winter wheat here is the last week in August. We are thirty miles south of the Minnesota line. It gets a nicer start in the fall making a splendid protection for the roots in the winter, as the wheat holds the snow from blowing away. It will do well sowed until the 15th or 20th of September, if it has protection from the north and west winds. It has been grown here for the last four or five years with great success, farmers sowing from four to ten acres each. I saw a little spring wheat this harvest that was plowed in last fall, on the south side of a piece of timber, that was nice, but not enough for a fair test. This season winter wheat is splendid, and spring wheat is nearly a failure. Farmers here claim a yield of thirty to fifty bushels per acre of winter wheat, but I think there is no exaggeration in saying the yield was thirty to thirty-five bushels for the early-sown wheat. Late-sown wheat was as low as eighteen bushels per acre. There has been a great many car-loads sown this fall. All that was grown here is sown again, and several cars shipped here. I consider land with a south slope as far the best, and when it has a grove on the north and west, a good crop is almost a certainty. Sow a bushel and three pecks to two bushels per acre, as the berry is very large. A. WEBSTER.

The Construction of Furnaces.

From Mr. Wm. M. Barr's new book, the "Combustion of Coal," we make the following extract, from a paper read by Mr. Charlas Fairbairn a prominent English iron manufacturer, regarding an important point in the use of steam power too often overlooked by engineers. Now that the steam engine is coming to play so important a point in merchant mills, it is important that mill owners and millwrights should be conversant with every detail in its application:

The indispensable conditions attached to a good furnace, for all kinds of fuel, are,

1. A good draft, which can be regulated at will, so as to avoid forcing the fire too much.

2. A large and roomy combustion chamber, surrounded by fire bricks, and removed, if possible, from the place where the heat is to be used.

3. That the sides, or walls of a furnace, have at least ten thicknesses of bricks nearest the fire, and an outer wall having an air space between of about three inches.

4. That the supply of air to the furnace can be regulated at will.

"I do not think we can always recommend these conditions, especially in a furnace constructed on the principle of depending on atmospheric pressure for draught; and the reason is obvious, because in order to obtain a good and equal draught we require not only a tall chimney, but the chimney must be maintained at a high temperature, about six hundred degrees; and as the temperature within the furnace may be assumed at twenty-five hundred degrees, the abstraction of this large quantity of heat to keep the chimney at a sufficiently high temperature, amounts to one-fourth of the heat, and consequently of the fuel which is expended for that purpose alone. Nor is this the only drawback. The attendant on the furnace, who may, and often has other duties to perform, puts on a heavy load of coal. The flues and chimney are rapidly cooled, and the power of the draught reduced at the very time when it should be greatest.

The second and third conditions mentioned may assist in getting over irregularity in the power of the draught to a certain extent—that is, a large and roomy combustion chamber, and the sides constructed to prevent loss of heat.

I do not suppose any person who has not had an opportunity of seeing a furnace in operation, with the heat confined in the manner described, could have believed the effect would be so powerful; the inner lining actually acquires a white heat, thus serving as an accumulator, which is given out again when the temperature of the fire is reduced (as in the case of a fresh charge of fuel), and at the same time assisting to bring the fresh fuel into active combustion more rapidly; the heat is again returned to the fire bricks, and kept ready for future use. Dr. Siemens has taken advantage of this idea, although in quite a different way, in his celebrated gas furnace.

We will now consider our furnaces as at present constructed, and why they are so wasteful. We hear a great deal about thin fires and regular charges in the ordinary; and this is quite correct, inasmuch as it is the only way by which a right supply of air can be introduced to mix with and consume the gases. There are always two dangers we have to avoid: One is too much air, which is the least of the evils, and in which case a very large body of air passes away unconsumed, but it also carries away with it a certain amount of heat which cools the furnace and impedes the draught. The other evil of too little air is still more injurious, for the gases having only a small share of the oxygen required are burned into carbonic oxide, and this very often accounts for the deficient supply of steam from a boiler, in consideration of the coal burned. But these fires are liable to burn into holes and admit streams of cold air; nor is this the only objection, for when the fire is fed with fresh coal, which must of necessity be very often, the new coal absorbs a large proportion of the heat of a thin fire, and immediately lowers the temperature.

The fire contains a certain number of units of heat. If twice the quantity of coal was in active combustion, there would be double the number of units of heat, and it could therefore more easily sustain the reduction of temperature following a fresh charge of coal. I imagine the distillation of gas from coal or votalization is a process similar to steam carrying off the heat from boiling water. The coal at first becomes an absorbant of the heat and then liberates the gases, and the volatilization of the bituminous portion of the coal acts in a similar manner to the production of steam, as I heve said. The process is one of the most energetic known in cooling, because there is so large a portion of the heat converted from the sensible to the latent state.

Regarding the quantity of air required in an ordinary furnace for the combustion of coal, I suppose very few people have any idea of the magnitude of the demand.

It is generally given as 300 cubic feet, or 24 pounds of air to one pound of coal. Let us place this in another light:

In my own establishment at Gateshead I have seven furnaces, each of which uses about one ton of fuel per day, in all about seven tons, therefore 7x24—168 tons of air required. Again, a pound of coal requires about 300 cubic feet of air. If we imagine the 168 tons of air made into a long stream of one square foot in area, the total length will be 21,381 miles. Another great cause of the loss of heat, as before stated, is the quantity of heat continually passing away to the chimney.

One difficuly—that is, regulating the supply of air to the furnace—can only be overcome by artificial means, either by a fan-blast or steam-jet. I believe the time is fast approaching when the supply of air to furnaces will be regulated in this way, as the most efficient and economical, and as obviating a great many of the faults of our presen furnace.

The idea is old enough. However, the arrangement of the furnace, I will describe presently, may or may not be new. I never saw it before, nor am I aware that anything of the same kind has been tried, and to it I have added a supply of air by means of a blower. In this furnace, the coal is introduced from the top, and is always on top of the incandescent fuel, at the side of the furnace furthest from the place where the flame makes its escape.

The hearth is of fire-brick, and during the meal hours all the ashes and clinkers are removed by the hole in the side of the furnce.

The blast is introduced above the new coals, and passes through them. As the coals begin to ignite, all the inflamable gases are forced through the fire, and at the same time mixed with air.

The advantages of this kind of furnaces seem to be the following;

1. The whole of the gaseous products are made available.

2. There is entire absence of smoke, in consequence of perfect combustion.

3. There is a smaller quantity of air required, probably about one-fourth less; that is, about eighteen pounds of air to one pound of coal.

4. No increase of temperature above the external air is required in the chimney, and the escaping heat from the furnace can be used for other purposes.

5. A higher temperature in the furnace, and more rapid circulation of heat.

6. The perfect control which the attendant has over the furnace as regards temperature, getting the fire lighted and into operation in less time, when they have not been in use.

There is also another very important point in connection with this method of making re heating furnaces—that the air can be so nicely adjusted by means of the blast and damper, as to insure that nearly all the oxygen will be taken up by the carbon and gases, in consequence of which the iron is heated with scarcely any loss from oxide or scale. The balance of pressure can be made so that even where there are unprotected inlets in the interior of the furnace, the flame can be made to come to the edge of the open space.

I believe the efficiency of the furnace might be largely increased by using hot air, which might be done by passing it through pipes or brick work placed in the flues; for if we have the heat of the furnace twenty-five hundred degrees, and the entering air heated to five hundred degrees, the result would necessarily be a great saving. On this point we have the experiences of blast furnaces as an indication of what might be saved by this means alone.

I have again to mention that a furnace, which will suit admirably for one kind of coal, will not answer for another. Thus, the conditions under which coke and anthracite coal enter into combination with oxygen, are much less complex than in burning bituminous coal, and the great point to be observed is, that a large quantity be kept on the bars; there is not so much danger of the carbon passing away without its supply of oxygen—in fact, it cannot do so, as it cannot rise until it has its quantity of oxygen to liberate it. In bituminous coal the bituminous portion is only serviceable for heat when converted into gas, while the carbonaceous portions are consumed only in the solid state, and they must be separated, as explained, before they can be consumed. Thus, when coke or anthracite coal are burned, the products are carbonic acid gas, and nitrogen; while with bituminous coal we have carbureted hydrogen, nitrogen and carbonic acid gas, or oxide.

It is supposed that in some instances we have realized about seventy per cent of the theoretical heat in fuel. This, I would be inclined to doubt. We have seen that with the ordinary furnace we lose about twenty-five per cent in getting a draught; we have to add to this loss from small coal, too much or too little air; the products of combustion flying off to the chimney at a speed of thirty feet in a second in some instances, it must be abundantly clear that fifty per cent of the heat of fuel we use is lost. It has been stated that, in some processes in connection with the manufacture of iron, the quantity of fuel used was sufficient to produce the desired result fourteen times if properly applied. I think it is clear we begin by placing the chimney at the wrong end of the furnace, and the air ought to be driven in, and drawn through. We have seen when a blast is used we can have a pressure in the furnace sufficient to balance the pressure of the atmosphere. The waste heat could also be made to do work in passing away. I dare say most of us now present can recall instances to our mind where a number of furnaces are used, and where the heat of one, if it could be retained and applied, would be amply sufficient.

The blast, then, is the only means of doing it, and I do not think the time is far distant when the hideous piilars we seem so fond of now will be no longer seen.

Influence of Intense Heat on Wheat.

Dr. O. W. Anderson, of this city, has called our attention to some important considerations concerning the failure in the wheat crop. He agrees with the statements already made in these columns that the condition of the weather had much to do with the matter. He says that wheat will not grow to perfection in a hot, dry season, as high temperatures destroy the vitality of the plant. He has taken pains to investigate the matter and finds that good English and French authorities are agreed that a cool climate is the best for wheat, and experiments have shown that it does best in a temperature averaging from 43 to 65 degrees, Fahrenheit, while it failed to mature in a hothouse heated to 100 degrees.

Dr. Anderson says he has no doubt the hot summer weather of the past two seasons was the chief cause of the poor wheat crops produced. In 1877 the weather was uniformly cool and the result was a bountiful crop. He has kept careful accounts of weather indications, during the summer months, for several years, noting the state of the temperature at six o'clock in the morning, at noon and at six o'clock at night. By an examination of these figures it will be seen that the mean temperature of the last two years, during the summer months, has been much higher than for a corresponding period in '77. For instance, during the hottest days in June, 1877, the average range of the thermometer was about 65 degrees.

The average temperature from June 15 to July 15, 1878, at the hour of 12 o'clock m., was 88 degrees, and for the same period, this year, it was 91 degrees. The heat upon certain days of the former year, was very intense, and at this most critical period the weather was very wet, causing the wheat to blight badly. This year on the 5th day of July, the thermometer indicated 105 degrees in the shade, and there is no doubt that the continued stage of hot weather had a marked effect upon the growing crop and shrinkled kernels, or partly blighted heads of wheat resulted therefrom.—*Rochester Minn. Record.*

XUM

Milling News Items.

Prairie Mills, River Falls, Wis., are again in motion.

Some talk of a stock company steam flouring mill being built near Ellsworth, Wis.

The mill company are taking in a little wheat, storing it in the old mill.—*Dundas, Minn., News.*

R. Grigg & Co.'s mill at Cannon Falls, Minn., will soon shut down and undergo extensive repairs.

A $10,000 flouring mill is soon to be erected and put in operation at Fisher's Landing, Minn.

The mill at Concord, Iowa, is shut down for repairs. Mr. J. W. Ivers is the millwright in charge.

The Junction Mills, River Falls, Wis., are turning out over three hundred barrels of flour per day.

The new warehouse at McClure's mill, Sauk Center, Minn., is nearing completion. It is a solid structure.

Medford, Minn., is anxious to have reliable parties put up a mill there, and would give a liberal bonus to such an enterprise.

Spivak and Martin's new grist mill is all ready with a new turbine wheel and plenty of water for the fall trade.—*Rush City, Minn., Post.*

Messrs. I. D. Titsworth & Co.'s mill at Milton Junction, Wis., shut down on the 16th for two weeks. Some new machinery will be placed in position.

The Stillwater mill, at Stillwater, Minn., started up on Tuesday, the 16th, having completed improvements at which they had been at work for two weeks.

Kimball & Beedy, of Forest City, Minn., have taken out their old water wheels and substituted for them one immense turbine wheel. The mill will start up next Monday, if nothing happens.

The millers are paying eighty cents for good milling wheat. The mill of Davis, Schmidt & Bro., was shut down Monday, for a few days to make necessary repairs.—*Elkader, Iowa, Register, Sept.* 11.

The Milwaukee Middlings Millstone company are erecting a $4,500 mill at Anoka, Minn., to replace the one destroyed some time ago. It will have five run of stone and have the patent process machinery.

The cooper shops of D. Syme, at Long Lake, Minn., were destroyed by fire on the 15th, together with four hundred flour barrels, and five sets of coopers' tools. The loss is about $500, with no insurance.

The Milwaukee Middlings Millstone Company are erecting a $45,000 mill, at Anoka, Minn., to replace the one destroyed some time ago. It will have five run of stone and have the "patent-process" machinery.

Atlanta, Ill., Sept. 14: The Turner flouring mills, the largest in the county, caught fire last evening and for a time threatened the destruction of the entire property. The flames were subsequently extinguished. Loss about $1,000.

Operations are under way for enlarging the Gate City flouring mill, Winona, Minn., under the management of J. D. Emerson, lesse from H. W. Lamberton. Improved machinery will be introduced and the capacity of the mill will be six to eight hundred barrels per week.

Park Marriman, father of William Marriman, who was killed at the Capitol mill in St. Paul, on July 13, by the falling of the platform of the elevator in the mill, has brought suit againt Henry Schurmier and John Archibald, owners of the mill, to recover $5,000 damages.

The mill company are doing nothing by halves. Every piece of machinery they introduce is first class, as its cost will show. The improvements complete will cost Messrs. Archibald & Co. over $40,000, making the Dundas mills the best equipped of any in Minnesota.—*Dundas Minn., News.*

Under the supervision of A. F. Dawson, the mill building of Mr. Jno. M. Cole at Rochester, Minn., is completed. The building is 48x76 feet. The machinery is furnished by Messrs. E. P. Allis & Co., and is being put in position as fast as it arrives. It is the intention of Mr. Cole to spare no pains to make this mill one of the best in the state.

The new flouring mill at Peterson, of which we made mention a few days ago, is, from present appearances, not likely to be built this season, owing to a disagreement about the water power. Our article regarding this new enterprise was written after consultation with the parties in interest, and when no doubt was expressed as to the early commencement and completion of the work.—*Rushford, Minn., Star.*

Work has been commenced upon the foundation of the new engine house for the Archibald mill, at Dundas, Minn. It is to be 36x50 in size and 20 feet in height, of solid stone masonry. When completed, it will be occupied by one of the finest engines in the country, 160 horse power, costing about $8.000. In connection there will be two and perhaps three mammoth steel boilers.

The awards of contracts of flour to be furnished the department of Dakota were made on the 16th, as follows: Messrs. Archibald & Schurmeier, of St. Paul, 1,752 barrels at $5.59 per barrel, and 90,000 pounds in double sacks at $5.59 per barrel, delivered at St. Paul. William Miner, of Yankton, was awarded the contract for 1,368 barrels at $5.40 per barrel, and 90,000 pounds in sacks at $2.65 per 100 pounds delivered at Yankton.

Elmer Gould, engineer at Olds & Fishbeck's flouring mill, at Rochester, Minn., was severely burned upon the hand and arm by steam recently. The singular part of the accident being, the part of the arm covered was burned deeper than the back of the hand, which received the steam first and direct; it was thought at one time that he would lose his arm up to the elbow, as the flesh peeled off in shreds, and huge blisters came up opposite from where the steam approached.

Work on the building of Yeo & Clark's new four-run mill at La Crosse, Wis., to replace the one operated by that firm which recently burned, has been commenced under the able superintendence of S. J. Burnett, a well known La Crosse millwright, who has the contract for furnishing everything. The mill will be 30x42 feet, four stories high with basement, and when complete will have cost about $10,000. Its machinery, of which a set of porcelain rolls will be a part, will be of the most approved patterns. Mr. Burnett expects to have the mill in running order by the first of December.

Marshall, Ill., Sept. 16: The Marshall mills, operated by Lycar & McMullen, caught fire on the upper floor this afternoon, between two and three o'clock, and defied the utmost exertions of the citizens to quench the flames. The mill was brick, and was built about five years ago, and cost $20,000 when built. Mr. McMullen had an insurance of $5,000 on his interest, divided equally between the North American and Pennsylvania companies. A new warehouse had been built for storing wheat, consequently there was very little wheat in the mill. The warehouse was saved, and with it about six thousand bushels of wheat and three hundred barrels of flour. The total loss is about $16,000.

The county commissioners go to-day to look into the advisability of laying out a road from the station on the Rochester & Northern railroad north of New Haven into Oronoco. The flouring mills at the latter place have to draw their flour five miles, when by a new road two and seven-eighths miles they can shorten the distance nearly one-half. It will be remembered that Dick Jones presented a bill in the legislature to open a public road, but it was defeated, the town of New Haven and the south part of Oronoco opposing it. Messrs. Gooding & Co., owners of the mill, offer to give $1,000 to aid in its construction.—*Rochester, Minn. Cor. Pioneer-Press, Sept. 17th.*

Mr. M. F. Monson built a residence early in the season, and now occupies it with his family. His steam flouring mill is to be a large and substantial building. It stands on the lake shore near the foot of the hill. The main building is 44x35 feet. The foundation is a massive wall of granite two feet thick. From the sills to the plates is forty-one feet, divided ito three stories. Above the plates is a fourth story. The timbers are mostly hewn oak, from 8 to 12 inches square. Last Tuesday the first story of the frame was raised. Next week the balance of the frame will be erected and the whole building sided and roofed as quickly as possible. A large force of workmen is employed. The work is all to be done in the most thorough and substantial manner There will, at first, be three run of wheat stone, and an iron feed mill. There will be space and power for two more run of stone, to be put in at any time if business demands it. The engine room will adjoin the main building. There will be two large boilers, each of fifty horse power, and an engine of seventy horse power, all new and first class. Mr. Monson hopes to have all complete and ready for business by Dec. 1st. He is also building a store 22x50 feet, and will open up a large stock of general merchandise this fall. He will build an ice cellar next spring, and a grain warehouse next year. He has two lots in the village and a farm of 165 acres near by. These costly improvements absorb a heavy capital and will add greatly to the value of all property in that part of the county. The mill will be a convenience and an advantage which the south side of the county will not fail to appreciate.—*Holmes City Cor. Alexandria (Minn.) Post.*

Hitherto, as is well known, it has almost invariably been assumed that the softer a bar of steel was, the more likely it was to endure strains and shocks causing vibration. Some recent observations, however, appear to show that hard steel suffers less from vibration than the soft. This has been especially noted in the constant breakage of steam-hammer piston rods. Experiments have shown that that those made of ordinary steel lasted but six months, an iron rod breaking in half that time. Lower and lower steels were tried, and broke in about five months. An accident caused, in a certain instance, the hurried use of a comparatively high steel rod, assuming that it might last a week or two, but it actually held out for more than two years.

The Eau Claire *Free Press* says: We have in our midst one of the most wonderful boys in America. He is the son of James and Ellen O'Shea, residing on North River street, in this city. They have lived in this and Dunn counties for the past twenty-three years. The boy commenced life 15 pounds avoirdupois; he is now 11 years old, 5 feet 11 inches in height, and weighs 224 pounds.

The New Flouring Mill at Mankato.

[Special correspondence of the Northwestern Miller.]

Mankato is a flourishing city of about 6,000 inhabitants, and is charmingly located in the valley of the Minnesota river, on the line of the St. Paul and Sioux City railroad– about 85 miles from Minneapolis and St. Paul. The surroundings are beautiful, and it is one of the oldest settled districts in the great and prosperous state of Minnesota. The adjacent country is a rich and fertile region. The city is blessed with a number of manufacturing establishments of various kinds; but its crowning glory is the handsome new five story brick mill, which is fast nearing completion and will be ready to start in a very short time. It is a little over a year since the first work was commenced on the mill. It is four stories above the basement, and is built of red brick, having a splendid foundation of Kasota stone

The mill is owned by R. D. Hubbard & Co., and has been under the immediate supervision of Mr. F. L. Waters. The machinery is furnished by Hulbert & Paige, of Painesville, Ohio, and is certainly a great credit to the manufacturers. The boilers are furnished by Hulbert & Paige. But the engine of 225 horse power is furnished by D. Brown, of Fitchburg, Mass., and is a magnificent piece of machinery. The fly wheel is about twenty feet in diameter, and weighs 16 tons. The mill contains 12 run of 4 feet buhrs, also a number of Wegman's porcelain rolls, also the Inn rolls, all with Gray's noiseless belt attachment, furnished from the well-known house of E. P. Allis & Co., Milwaukee. The cleaning machinery is from the old reliable house of Barnard & Leas, Moline, Illinois. The mill is very complete from basement to attic, having high ceilings, ample bolting capacity and machinery for purifying middlings. They are supplied with the Victor wheat heater from the Victor Heater Company of Minneapolis. The storage capacity is ample and well arranged, being so situated that three teams and one car can unload at once.

They are putting up a fine office in the mill, having all the conveniences of a first class bank. The office is furnished with a large double-doored vault, fire-proof. In connection with the mill, is the city water works—which is provided with steam from the mill boilers. The pump and engine in connection with the city are independent of the engine that drives the mill. The mill is well provided for in case of fire, as any or all the floors can be flooded almost instantaneously. This mill is certainly a credit to the city and the proprietors, and to the skill and ability of the man who planned and superintended the building. Taken all in all this is one of the finest mills in the state, and it is to be hoped that it will be a paying investment to the proprietors.

W. H. Rockey & Co., have also a very good five run mill driven by steam. This mill is a stone structure and was built a number of years ago, and as there has been a constant adding of machinery for the last few years it is well filled up. This mill has an established trade east and can dispose of the products at a fair margin. Messrs. J. D. Tolman & Co., have a five run mill located about four miles from the city. This mill is driven by water power. They, also, have a market east and at home for all they can do. These mills will have all the good wheat they want, as the crop through this section is good.

HAMBURG.

Mankato, Minn., Sept. 13th, '79.

Australian Crops.

The Melboure *Argus* of Aug. 6th, has the following in regard to the weather and crop prospects in Australia:

"The weather during the past month has been thoroughly wintry. The temperature has been generally low, series of frosts having occured weekly, and these have been followed by rains. Unfortunately, the fall has been much too light for the requirements of the country. The intervals between the frosts have been dull and cloudy, and the showers have been more than commonly partial. The soil in most parts of the colony has not been moistened to a greater depth than thirteen inches; such has been the case at Learmonth and other cool localities. In some portions of the Avoca district, it is said, the crops are too far gone to recover; rain, however, has just been falling there, and although the quantity is small, it will probably keep the crops going until a more ample fall is experienced. The situation is, however, becoming critical. At the ploughing matches which are daily held at this season of the year, the dryness of the soil at the depth of an ordinary furrow has, in nearly every instance, been mentioned as an apology for the roughness of the crest. That this should be the case can hardly be deemed surprising, in view of the fact of the eighth month of the year having commenced with only 8.63 inches of rain recorded, against 17.7 inches during the corresponding time last year, or a general average of 14 25 inches for the same period during the last twenty-one years. It is fortunate that the whole colony is not equally short of moisture. Gipps Land has had floods more than once, but those portions of Victoria which are usually dry are precisely the parts which have not received a fair share of moisture. The season in many parts having been slightly dripping and the subsoil dry, the crops in these districts are looking well; but locally there is anxiety with respect to the future. A few warm days would disclose the want of reserve moisture in the subsoil. It is, however, too early to prognosticate results. In several successive seasons prospects for better or for worse have been entirely changed as late as the middle of September, and more than once the month of November has proved the arbiter of their fate.

Honorable Humility.

Gen. Bauer, who commanded the Russian cavalry in Holstein, was a soldier of fortune, whose family and country were unknown to every one. When encamped near Husum, he took a mode of discovering himself as novel as it was amiable. He invited all his field officers and some others to dine with him, and sent his adjutant to bring a miller and his wife who lived in the neighborhood to the entertainment. The poor couple came, very much afraid of the summons, and quite confused when they appeared before the Muscovite general. Bauer, seeing this, bade them be quite easy, for he only intended to show them kindness, and had sent for them to dine with him that day; at the same time he conversed familiarly with them about the country. At dinner the general placed the miller and his wife one on each hand, and nearest to him, and paid particular attention to them. In the course of the entertainment he asked the miller many questions about his family and relations. The miller stated that he was the eldest son of his father, who left the mill he then possessed, and that he had two brothers and one sister.

"Have you no other brother?" asked the General.

"No," replied the miller. "I once had another brother, but he went away with the soldiers when he was very young, and must have long ago been killed in the wars."

The General, observing the company much surprised at his conversation with the miller, said to them: "Brother soldiers, you have been curious to know who I was, and whence I came. I now inform you that this is the place of my nativity, and you have heard from this miller, who is my elder brother, what my family is." Then turning to the astonished miller and his wife, the General embraced them, saying he was the brother they had supposed dead. The General then invited the whole of the company to meet him the next day at the mill, where a plentiful entertainment was provided, the General pointing out to his brothers in arms the room in which he was born, with as much evident joy as if he had been shewing them the place where he had gained a victory.

Self-Made Men.

Self-made men are more certain than others of success in life for the reason that, so to speak, they are more thoroughly made. That is to say, with them the formation of character is more solid because it is the result of severe discipline, of a determined will, of a settled purpose. It is not the mere accumulation of the teachings of others, to which, too often, only a lazy and drowsy attention has been given.

The self-made man starts at the bottom. He not only has to learn by himself how to ascend the steep and rugged stairs before him, but he has to rack his brain how to construct the stairs themselves by which he shall ascend.

Hence he understands more accurately than another, all the conditions of success. His attention becomes more fixed. His thoughts are habitually concentrated on whatever he undertakes. His judgment is matured by the necessity imposed upon him for its constant exercise. He is wary and watchful, and robust in all his being, as the gymnast by constant exercise excels in the developement of muscles.

Hence it is that the community feel greater confidence in self-made men. There is a common feeling that he who has succeeded against great odds, who has made his mark where those possessed of many advantages over him have failed to make theirs, must possess in himself remarkable elements of success. And the community are right. The self-made men are on the whole the safest to be intrusted with great undertakings. The stuff of which they are made has been tested and has been found to be of the durable kind.

A friend, just returned from Philadelphia, saw in operation there a silent gas engine which worked with marvelous beauty and efficiency. The engine consists mainly of a jacketed cylinder, with a piston, slide valve and governor, having a cut off mechanism to regulate the supply of gas according to the varying load on the engine. The pressure utilized for the production of the power is generated in the cylinder, and is made at once available to propel the piston. There is no boiler, no danger of explosion, no pump, no engineer, no extra insurance, and very little attention required. It is about as easy to start the engine as to light a gas burner. Mr. Strong, the inventor of fuel water gas, expresses the opinion that one of these engines of twenty-horse power may be run for less than one dollar a day.—*Yonkers Statesman.*

Moorhead, Sept. 17—The want of cars to move the wheat crop is being seriously felt by the shippers. Thousands of sacks are lying piled up on the side tracks and have been for several days, and flatboats lying at our levee want cars badly. Should we get a heavy rain many thousands of dollars damage would be done in this vicinity. Many parties are actually shipping grain in sacks on open flat cars, thus running the risk of losing their grain by rain or having it burned up by sparks from locomotives. The St. Paul, Minneapolis and Manitoba railroad should make a note of this and act accordingly.

General News.

The Manitoba road is now running regular trains to Evansville, eighteen miles above Alexandria, Minn.

At Waterville, Le Sueur county, a fine span of horses belonging to Dr. E. P. Cases. were poisoned Monday night.

Faribault is to be lighted by nine gas lamps. Eleven thousand dollars is to be raised for municipal purposes during the ensuing year.

At Albert Lea the Presbyterian Synod for Minnesota and Dakota, meets Oct. 9. Jacob Ellenson will start a Scandinavian paper there Oct. 1.

Bounty was paid on five hundred and ninety-eight pocket-gophers at the Dodge county, Minn., treasurer's office during the months of July and August.

At Stillwater, Miss Lillie Christenson lingered too long on a car platform, taking leave of friends and falling off when the cars were moving, had her arm broke.

A disastrous fire occurred the other day at Volga City, Iowa. A railroad elevator, several loads of grain and 55,000 feet of lumber were destroyed without insurance.

A rattlesnake five feet and two inches in length, with eleven rattles, was killed on the road betwegn Maiden Rock and Stockholm, Wabashaw county, Minn., the other day.

Mrs. E. J. Holt, of Centerville, Iowa, made a purchase of eggs the other day, in one of which was found, when opened, a grain of wheat sprouted, and with roots two inches long.

A recent order by the president throws the public lands in Audubon county, Iowa, on the market. There are about five hundred acres. By the president's order, the people who have settled on the lands will have the first right to pre-empt, and will of course retain their lands.

There are 41,111 post offices in the United States, the increase in three months being 471. Of this number Pennsylvania has 3,349; New York, 2,925; Ohio, 2,318; Illinois, 1,957; Virginia, 1,565; Missouri, 1,661; Indiana, 1,610; Alaska, 2. Illinois stands fourth on the list.

Recently thieves entered the butcher-shop of Fred Lewon in Omaha, by breaking in the back door. They then attacked the safe with a heavy miners pick, and succeeded in making a hole six inches square through the side. They then broke through into the money-drawer, but got nothing, as the safe had not been used for a long time. It was unlocked all the time, and had thieves tried the door they could have opened it without trouble.

Late Milling Patents.

A list of United States patents, issued to inventors of milling machinery and milling processes, for two weeks ending September 12, 1879. Reported expressly for the NORTHWESTERN MILLER by A.H. Evans & Co., patent solicitors, Washington, D. C. Attorney's fee in patent cases $20. Patent Laws sent free on application.

Mill Stone Dresser, 219,514; Frank H. Plummer, Epsom, N. H. The object of the invention is to employ a machine that will work upon any part of the stone, at any angle or draft from the center, and on right or left hand stone. The machine employs a revolving diamond, and the claims are for the details of construction to operate the same.

Mill Stone Polisher, 219,391; Horace Deal, Bucyrus, Ohio. The object of the invention is to provide a corundum-block millstone-polisher having a handle, yet capacitated for use of each of the four sides of a composite corundum block; and it consists in a composite corundum block cast with a rod through its center and projecting at its ends to enter eyes in a curved handle bearing a spring-catch, so arranged as to hold the block in position when any one of the faces is exposed to use. the handle and block remaining in a stationary position in relation to each other.

The claim is for a composite corundum block, cast with a central pivot, in combination with a curved handle, carrying a spring claw, for the purpose specified.

Manufacturing and Trade Items.

Colton Bros.' five-run new process mill, being furnished and set up by Nordyke & Marmon Co., of Indianapolis, Ind., is receiving the finishing touches, previous to starting up. The mill presents a fine appearance.

H. Kreisher & Son, of Frankfort, Ind., recently had their mill changed to the new process, by Nordyke & Marmon Co., of Indianapolis, Ind. Their business now enables them to add two additional run of buhrs to their mill which they have done recently, so that orders for their excellent flour can be promptly filled.

S. P. Heacock, of Chillicothe, Iowa, Parker & Bowdell of Leighton, Iowa, Whitmore & Son of Oskaloosa, Iowa, and J. Bosley of Walnut, Iowa, all have ordered of Nordyke & Marmom Co., of Indianapolis, Ind., the machinery for making new process flour.

Millers passing through Orrville, Ohio, may notice the handsome six-story brick building which is being built along the P., Ft. W. & C. R. R. Messrs. Willaman & Griffith are preparing this building for fourteen run of forty-eight inch buhrs, bolts, purifiers and all the latest improved appliances of the new process system of milling. The power will be a handsome two hundred and fifty horse power Corliss engine. All the machinery will be furnished and set up by Nordyke & Marmon Co., of Indianapolis, Ind.

Consoling a Widow.

Many years ago, a worthy minister of Connecticut, while on a journey, was passing the house of a former parishioner. Remembering that the gentleman had recently died, he thought he would stop and condole with the widow.

She met him with a cheerful countenance and they chatted pleasantly, until he, thinking of his purpose in calling, remarked:

"Madam, it is a painful subject, but you have recently met with a severe loss." Instantly applying her apron to her eyes, she said:

"Oh, yes, doctor; there's no telling how I feel."

"It is indeed a great bereavement you have suffered."

"Yes, doctor, very great indeed"

"I hope you bear it with submission?"

"I try to; but oh, doctor, I sometimes feel in my heart, 'Goosey, goosey gander, where shall I wander?'"

Doubtless the reverend gentleman kept his face in becoming repose while in the widow's presence, but when he resumed his journey his old horse must have wondered at his master's loud laughter.

Joaquin Miller says: "If you were to take a newspaper in your hand and crumple it up, and then spread it out again, the creases in it might fairly represent the streets and lanes of London, so angular, so awkward and irregular in this, the greatest of all cities in the world." The *Philadelphia Bulletin* says: "If you were afterward to turn it upside down and read it backwards, it would fairly represent some of Joaquin's poetry."

Mr. Hulbert, Agent of Millers' Association, and in charge of the elevator business along the lines of railroad, states that owing to delay in completing this branch line, and changes made in the location of depots, and the lateness of the season, the plans of the elevator company may be changed. It is not probable that a steam elevator will be built this year at any point between here and Fergus.—*Alexandria, (Minn.,) Post.*

Experiments made 180 years ago demonstrate that a bell, rung by clock-work, when placed under an exhausted receiver, emits no sound. The report of a pistol on Mont Blanc makes no more noise than the explosion of a percussion cap at the level of the sea, and æronauts tell us that at the height of two miles all sound ceases.

Petroleum.

When we are told that at the present time over 1,800,000 gallons of peroleum or earth oil are brought to the surface every day in the oil regions of Pennsylvania alone, the mind is staggered by the contemplation of the magnitude of this comparatively new industry. So lavish is Mother Earth of her hidden stores of oil that it is sent to the surface much faster than it can be taken care of, or stored, and at the present time 300,000 gallons, at the lowest estimate, run to waste every day. The great United Pipe Line, and other methods of conveyance, utterly fail to convey the oil to markets, and the enormous tanks for storage are full to overflowing. There are tanks owned by companies which hold 5,000,000 barrels of oil, and all of them are full. The wooden tanks owned by individuals and private concerns amount in their aggregate capacito as large a number of barrels, and these also are full.

Thus it will be understood that there are great lakes of oil above ground, as well as below; but there is good reason to believe that the subterranean deposits may with greater propriety be called oceans rather than lakes. The oil workers are evidently pumping from inexhaustible supplies in the rock chambers below, and what are called the "spouting wells" deliver their vast currents with the same impetuosity as when the drills first tapped the pent up stores. An interesting inquiry arises as regards what becomes of the oil that cannot be secured; into what place does it flow, and where is its final resting place? Any one who has visited the oil regions will know of the nature of the country, and readily understand that much of the oil flows into brooks or small rivers, and in time finds its way into the large rivers, and is lost ultimately in the Gulf of Mexico or the Atlantic Ocean. Still larger quantities are absorbed by the earth in ravines and marshy places, and thus it is lost to view. In the famous district one is led to exclaim, "Oil, oil everywhere, and no untainted water to drink." There is oil in the soil; oil in the springs; oil on the bushes and trees; oil in the atmosphere, apparently; oil on the clothing, and in the mouth, eyes, and hair of the workmen; the bread and coffee of the region have the odor of oil, and the beds are saturated with it.

How wonderful is all this! Well do we remember when the first vial of "rock oil" fell into our hands. It was called "Seneca oil," and it was claimed to be a most efficacious remedy for a variety of ills to which the human body is subject. The statement that it flowed spontaneously from a spring in Pennsylvania was received at first with much incredulity, as that was regarded as impossible; but in a short space of time the truth was known, and the oil was no longer regarded as a mixture devised by human hands.

American petroleum oil is now used as a source of artificial illumination in nearly all parts of the world. It goes along with rum, powder, and muskets to the savage tribes of Africa, and the mud houses on the banks of the rivers of the interior are illuminated by its combustion; it is found in the interior of the Turkish empire, in Persia, in Egypt, in Palestine, in China, in Japan, and in the remote islands of the sea. For the paltry sum of fifteen cents we can purchase a gallon of the clear, refined oil, and the cost of the light afforded, in comparison with gas as furnished at the lowest cost in cities, is as one to twenty in its favor. It is just now the most formidable antagonist of gas, and we can scarcely hope in the utilization of electrical force in the future, to secure light at a lower expense.—*Boston Journal of Chemistry.*

Something About Rollers.

[Translation from Prof. Kick, in Corn Trade Journal.]

The *roller material* is not altogether without influence on the product. The finer and sharper the pores of the material, the whiter will be the color of the flour. Thus porcelain rolls give a somewhat whiter flour than chilled iron rolls. This higher degree of whiteness is, however, *no* the consequence of a smaller admixture of bran particles, but of a greater degree of fineness. There cannot seriously be any question of the steel or chilled iron rolls giving off any coloring matter whereby the color of the flour is influenced. Bakers prefor a pure yellowish flour to that which is excessively white; this is a point which is not favorable to porcelain rolls. The question of durability and the price must be a consideration of the greatest importance when deciding on the choice of roller material. *Porcelain rolls* are somewhat cheaper, *chilled iron rolls* very much more durable. Steel rollers get easier out of truth, and also break more easily, than chilled iron; porcelain rolls do this in a still higher degree, and they are moreover, subjected to no inconsiderable amount of wear. The following is part of a communication from Ingenieur Blumenthal, in Nuremberg—"A Bavarian mill, which was fitted up in 1877, contains, besides chilled iron roller mills, also porcelain rolls with differential speed. While the former show no trace of ware, the porcelain have got smaller by two to three millimeters (1-12 to 1-8 inch). This was found out not through measuring and comparing with the original diameter, but through the rollers having got shifted somewhat lengthways, one end of each of the two rolls rhowing a rim of 1-12th of an inch, the rollers having been at work not quite half a year.

In this case a faulty mode of working the machine may have caused an excessive wear, still it proves that this material wears more than is good for everyday work. Porcelain also requires turning up frequently in order to keep them in true cylindrical shape, a disagreeable work for the miller, which, with chilled iron and steel rollers, he can dispense with for several years.

At the Paris exhibition we noticed that Wegmann's porcelain rolls were of such excellent quality, that little pieces of quartz did not in any way injure the rolls; the stones were, however, crushed by them, notwithstanding the elastic spring pressure.

For grooved rollers, stone, porcelain and glass rolls are decidedly inferior, although the cutting of the grooves by means of the diamond dressing machine does not cause any particu'ar difficulties. As a material for smooth rolls granite may be of equal value as chilled iron, but to our knowledge this material is not yet in use in flour mills.

A statement of the business done by the post office savings bank has been published, and shows that the government are borrowers from the people to the extent of $3,000-000, paying to the depositors interest at the rate of four per cent. The cost of management to the government is a fraction over half of one per cent. on the whole deposit. The loan, therefore, costs the government about four and a half per cent., and there can be no doubt that borrowing at home at four and a half per cent. is better for the country than borrowing abroad even at four per cent.

Upright legislator—"What sir! You take me for one who can be bribed? You insult my sense of honor. But in case I really was such a man, how much would you give?"

A Few Words About Steam Fitting.

FEED PIPES.

The feed valve should be a globe or angle valve placed near the boiler, with the fewest possible joints in the feed pipe between it and the boiler. If it is a loose or swivel disk valve, it should be secured with solder (sweated in) in the threads of the double part of the disk, so as to make it almost impossible to lose the disk from the stem; a mark with a center punch or chisel is not enough. The valve should be so turned toward the boiler that the inflowing water will be under and against the disk, so that in the case of the loss of the disk it will not act as a check valve against the influx of the feed water. This arrangement will bring the pressure of the water in the boiler always against the stuffing box of the valve; but all things considered it is best.

The check valve should be close to and outside the feed valve, with only a nipple between them. Always use horizontal check valves, as they admit of easy cleaning. With the ordinary vertical check it makes it necessary to take down some part of the feed pipe to clean it.

When two or more boilers are fed from the same pump, or when the pump is used for pumping water for some other purpose, it is well to have a stop valve on each side of the check valve, as it will enable the engineer to get at his check without stopping the water to the other boilers or elsewhere.

In passing through boiler walls or cast iron fronts, care should be taken that the feed pipe does not nest, or the settling of the boiler will break it off.

Use a flange union on the feed pipe instead of the common swivel union; the engineer can take it apart with a monkey wrench, and it makes a more permanent job and it will not leak.

Never put a T in the feed pipe inside the feed valve for the purpose of a blow-off; make a separate connection to the boiler.

BLOW-OFF COCKS.

Never use anything but a plug cock, of the best steam metal throughout. The reasons for using a cock are that the engineer is always sure when he looks at it whether it is shut or open. It gives a straight opening; if chips, packing or dirt gets into the cock, it will shear them off when closing, or if it does not the engineer knows it is not shut. Do not use an iron body cock with brass plug, for when the cock is opened to blow down a little the hot water expands the plug of the cock more than the body, and it is almost impossible to close it. Do not use a globe or angle valve, as you cannot always tell when it is shut; a chip or dirt getting between the disk and seat will prevent its closing. I have seen two fine boilers destroyed from this cause. Gate, or straightway valves are subject to the same objections as globe or angle.

When it is practicable there should be a T with a plug in it in the blow-off pipe, outside the blow-off cock, the plug to be removed when the cock is closed. By this means the engineer can always tell if he is losing water from his boiler.

The blow-off pipe should be large with few bends in it, and fire bends are better than elbows. It should be attached to the bottom of the shell of a horizontal boiler, and not tapped into the head a few inches up. When there is a mud pipe, attach it to it at the opposite end from the feed pipe.

SAFETY VALVES.

They are the main stay of the engineer, acting both as a relief and a warning signal. They should be attached to the steam dome high up. At the side is better than the top, as they are not so liable to draw water when blowing off in that position. They should be large and have a large pipe connection all to themselves. The ordinary cross body safety valve is very much to be condemned, and I think in some countries there are regulations against their use; they are constructed to save making an extra connection for the main steam pipe, thereby drawing the largest amount of steam directly from under the disk of the safety valve. A weighted safety valve is better than a spring valve when it can be used, as the lifting of the valve makes practically no difference in the leverage; not so with a spring valve, for the higher it is lifted the more power it takes to compress the spring.

GAUGE OR DRY COCKS.

Gauge cocks are various in style, the wood handle compression gauge cock being a very good kind for all purposes. When setting guage cocks care should be taken that they are not too low, and that the drip will not flow over the person who tries them. They should be tapped directly into the boiler if possible; but when it is necessary to use a piece of pipe to bring them through a boiler front or brickwork, give the pipe an inclination backward, that the condensation may run back and into the boiler. When the pipe inclines outward and down, the condensation remains in it and the cock, and will deceive the unwary, giving the appearance of plenty of water with a short blow.

GLASS WATER GAUGES.

Water gauges are best set when attached to a vertical cylinder at the front of the boiler. The cylinder should be connected to the boiler with not less than one inch pipe, top and bottom; the top or steam connection should be taken from the boiler shell near the front head, and not from the dome or steam pipe, as the draught of steam in either will cause the glass to show more water than the boiler contains. The bottom or water connection should be taken from the front head at a point where about two-thirds of the water in the boiler will be above it and one-third below; this will lessen the chances of the pipe stopping up with mud, etc., and it should also be provided with a half-inch pipe at the lowest pcint for a blow-out. When gauge glasses are set this way the condensation in the cylinder is downward, and the flow of water being toward the boiler through the bottom pipe, the tendency is to cleanse the glass and cylinder and keep them so.

Steam gauges should never be set much above or below the boilers to which they are attached, as each two feet of fall or elevation from the direct connection is nearly equal to a difference of one pound on the steam gauge; always when the gauge is below, for the condensation in the gauge pipe fills it with water, which leaves a pressure on the steam gauge equal to the hydrostatic head, which is a little over two feet perpendicularly to the pound per steam gauge, giving the gauge the appearance of being weak. When the gauge is above it is not always so, though generally, the pipes being long and of small diameter or trapped, which prevents a circulation of steam in them, they fill with water, which acts against the pressure from the boiler and gives a gauge the appearance of being strong. A good way is to connect the gauge pipe to a boiler below the water line, say twelve or eighteen inches, and have the gauge on the boiler about twelve inches above the water line, using no water trap or siphon, that the water may run back from the gauge when there is no pressure in the boiler, thereby preventing the possibility of freezing or of getting steam to the spring of the gauge.

Sometimes a steam fitter has to run a gauge pipe a long distance to an office or engine room. When such a gauge is far above the boiler he should run a large pipe direct from the steam dome and give it sufficient pitch to clear itself of water; it should be covered with some non-conducting material, and be of such size that the flow of steam through the pipe to supply the loss by condensation will be so slow as not to interfere with the flow of water along the bottom of the pipe in a contrary direction, and it should have a siphon immediately under the gauge.—*Cor. Scientific American.*

The Passaic Rolling Mill company, of Patterson, N. J., is at work boring an artesian well which, it is intended, will be from 2,000 to 2500 feet in depth. The ostensible purpose is to supply fresh and good water to the employes, but the general impression is that the work is undertaken in the hope that oil may be found, and there are plenty of sanguine Patersonians who expect to see Passaic county rival the Pennsylvania oil regions. Oil has been found exuding from fissures in the rocks in several places in the vicinity.

Old-Time Banking.

Some funny stories are told of business methods in the olden time, one of which will bear repeating as an illustration of the advantages silver dollars possess as a bank reserve.

The old Farmers' and Mechanics' Bank was established in Detroit in 1839. In 1845, owing to some disastrous operations in Ohio, it was temporarily badly crippled, and to tide over the crisis the directors lent their best energies. The bank had a large volume of notes outstanding, all redeemable in coin on presentation, and it was apprehended that the moment the condition of the institution became known a run would ensue which would compel the closing of their doors. Nowadays a bank officer would throw up the sponge under such circumstances, and suspend payment like a little man, but then bankers were both bold and fertile of expedient. The coin had run down very low, and there was no time to be lost. The services of a friend of the institution were secured, and he was privately sent to a large creditor (Lyell, the subsequently defaulting banker, by the way), to whom the critical state of the bank was whispered, and the wisdom of some measures for self-protection suggested. Lyell snapped at the bait, and, upon a hint from the officious visitor, rushed around to the nearest court and got out an injunction forbidding the bank to pay out any more coin pending the order of the court. This effectually saved the concern, for, when note-holders subsequently presented the bank's paper for redemption they were politely met with the reply, "We should be very happy to oblige you, sir, but unfortunately we are for a few days tied up by a process of the Wayne circuit court. We hope the injunction will soon be dissolved, when, etc."

It was late in the afternoon when the injunction was served, and the stock of coin had some hours previously dwindled to fifty-three dollars. The cashier meantime was on nettles. If that injunction did not come quickly the concern was ruined. At every opening of the door the poor man trembled in his shoes, lest the newcomer should be a note-holder in quest of coin. One more demand would close the concern forever. Slowly the clock ticked off the minutes, full thirty of which must yet elape before the hour of closing. Would that injunction never come! At last the door opened, and a nervous, bustling man hurried to the counter. The cashier saw at a glance that it was all up with him, but while there was life there was still hope, he thonght.

"Here, Mr. Cashier, I've got five hundred dollars of your notes I want coin for."

The cashier endeavored to preserve a placid exterior while he deliberately bethought himself how he might delay a refusal of payment for a little while, until, perchance, an officer would come in with the hoped-for injunction.

"So you want coin for your bills, do you?" suavely remarked the cashier, glancing with the corner of his eye through the open window into the all too quiet street.

"Why, yes! I live in Dexter, and I want to catch the four o'clock train; so please hurry up the specie."

"All right! What's the news in Dexter? How do the crops look? How's my old friend ——? Is he living there still? And, by the way, what in the world can you do with specie in that little country town that Farmers & Mechanic's bills won't accomplish?"

"Oh! never mind. Give me my money that I can catch the train. The fact is, there is a little flurry out there about the safety of your bank, and I want to make sure of my money."

"Ha! ha! ha!" laughed the cashier; "afraid of our bank, are they? Well, they must be getting pretty fastidious when the conservative old Farmers' & Mechanics' won't suit them. Why, my dear sir——"

"Never, mind the pedigree of your bank, but give me my money or I shall miss my train."

"Certainly, my dear sir." (Another glance through the window, but still no sheriff in sight.) Aside: "What shall I do?"

"There, I've got only ten minutes to catch my train. If you will assure me upon honor that it is all right, and that the bank is not going to bust, I won't wait now, but if you are going to shut up I want my money. Come, how is it old fellow?"

"Really, sir," replied the polite cashier, "you place me in a very delicate position. If I tell you the bank is safe, and anything happens hereafter, you will blame me; on the other hand, if I tell you it is shaky, I shall be unfaithful to my employers, and shall very justly be discharged. I prefer not to make any statement, but simply count out your one thousand half-dollars." (Half-dollars were the principal coinage in circulation at that time.)

Turning, screw-driver in hand, to a strong wooden box, apparently tightly screwed together, such as silver coin was usually packed in in those days, but which the cashier knew very well to be absolutely empty, he wiped off his brow and set himself to work as if to an herculean task.

The man glanced at the clock, then at the iron-bound coin-box, then mentally calculated the weight of a thousand half-dollars, then burst out with, "Never mind; I see you have got the coin, and I'll be cursed if I'm going to pack a thousand half dollars all the way to Dexter to-night. Never mind, Mr. Cashier, I won't trouble you" —and out of the bank he darted.

The injunction was served soon after, and the danger passed. But the old Farmers' & Mechanics' still kept up the habit of being short of coin, and did so till the last, when nearly twenty years later what was left of it was consolidated with a private bank and became the now prosperous American National Bank of Detroit. The worthy cashier still lives in Detroit, and finds a bonanza of enjoyment in recounting the amusing incidents of old-time financiering. —*Detroit News.*

Bound to Have a Bed.

Rev. Daniel Isaac was an eccentric itinerant preacher. He once alighted at an inn to stay all night. On asking for a bed, he was told that he could not have one, as there was to be a ball that night and all the beds were engaged.

"At what time does the ball break up?" inquired Mr. Isaac.

"About three o'clock in the morning, sir."

"Well, then, can I have a bed until that time?"

"Yes, certainly; but if the bed is asked for you will have to move."

"Very well," replied Mr. Isaac.

About three o'clock in the morning he was awakened by a loud knocking at the chamber door.

"What do you want?" he asked.

"How many of you are in there?" inquired a voice.

"There's me and Daniel and Mr. Isaac and an old Methodist preacher," was the reply.

"Then, by Jupiter, there's plenty of you!" and the applicant passed on, leaving Mr. Isaac to finish his night's slumber.—*Phila. Sunday Item.*

The Wonderlands of the Yellowstone Valley.

Gen. W. W. Whipple, of Sheridan's staff, who recently returned from a trip to the headquarters of the Missouri and Yellowstone rivers, is a most entertaining conversationalist, and the account given by him of his travels in the wilds of the northwest is stimulating to people with romantic minds. The general tells a fish story that is worth repeating to the readers of the *Times*. He says the "lone fisherman" would find inspiriting pastime if he should cast his line in any of the brooks or rivers in that wonderland called the "Yellowstone country." The man who undertakes to cater to the finny fellows in those mountain streams will have his hands full of work.

A curious fact about the fish in the Yellowstone is related by him. Below the falls the trout are fine fellows for table use. But above the falls the fish are wormy. It is no trick at all for a fisherman to land three hundred trout in ten hours, provided his arm doesn't become tired and the bait holds out; but the fish are unfit for use after they have been caught. No trout has ever been caught above the falls that did not carry a worm somewhere under its scales. The general examined a large number of trout, and everyone contained the worm. The worm, when examined, was found to be, in most cases, about eight inches in length, and resembling a piece of white tape. This reptile, when freed from its bed in the meat, would wriggle and writhe as if suffering from an attack of colic. It had two ends, of course, but which was the head and which the tail was more than the general could find out. Some think that the worms breed in the intestines of the fish, and then eat their way into the meat; but the general has a theory that the worms tackle the trout under the fins, as vermin tackle people under the arms, and make it a business to stay right there and eat a passage into the body. Millions of these fish die of too much worm, and float over the falls, and the regular sea-gull can be seen feeding on them almost any minute in the day.

Gen. Whipple says one cannot stand in the great canon of the Yellowstone and look up at the two mighty falls without experiencing a mingled feeling of sublimity and dread, Nature being so terrific and terrible in that spot. The walls of the gorge rise fifteen hundred feet above the river. In one place the river pours over a fall three hundred feet high. At another place, only a half-mile away, it takes another plunge of nearly two hundred feet. The terrific torrent is arched with rainbows below each fall.

But the general's description of his visit to the Yellowstone park is the strangest part of his interesting narrative. He spent some time in the neighborhood of the geysers. "Old Faithful" relieved himself of a vast amount of bile (bilin' water) at regular internals of one hour. He spouts with perfect regularity. The general found by such measurement as they had means for making, that the water was projected to a height of 171 feet, the eruption continuing several minutes. The water is too hot for bathing purposes. The soldiers who formed the general's escort chased "Old Faithful" every time he had one of those spells. A hat tossed into the ascending column would be carried up to the top of the jet and thrown off with the clouds of spray. One soldier, after witnessing "Old Faithful" in labor, remarked that he ought to be presented with a gold medal and an iron fence. The "Beehive" goes off once in every twenty-six hours, and spouts a sharp cut jet to a height of nearly two hundred feet. The general wanted to see the "Giant" throw up his gastric juice, but his stomach wasn't in a state of insurrection, and so the party had to be content with simply gaping into the crater, from which little jets of steam floated up in turbinated convolutions. Every one of the geysers gives a warning of the coming irruption, both by an awful rumble, caused, the general thinks, by an explosion of super-heated steam thousands of feet below the surface, and also by jets of steam which escape through the rifts in the rims of the craters. When the rumble is heard and the steam begins to escape, the water in the crater is thrown into a state of violent ebullition. Then it is time for the spectator to take a back seat. The soldiers told the general that the members of Hayden's geological survey had been guilty of the worst kind of vandalism. These fledgling scientists had broken off pieces of rock from "Old Faithful" and other geysers to put with cabinets of geological specimens. —*Chicago Times.*

The Mount Washington Railroad.

A correspondent of the Cincinnati *Enquirer* writes as follows:

"This railroad is a marvel of engineering, and was built by a Mr. Marsh, of New Hampshire. It is three miles in length, and rises 8,625 feet, or one foot in four. The principal feature of the railroad is the cog-rail in the center of the track. On each driving shaft of the engine is a cog-wheel. The teeth catch and work in the center rail, propelling the car up the mountain. The boilers of the engine are inclined downward, and when on a steep grade are quite horizontal. Every locomotive takes one car, and is provided with a double set of driving wheels, so that any danger from breakage of machinery is prevented. The ascent requires one hour and a half, and one could step off and on at any point. The track is strongly built, and is daily inspected by the twenty-five men continually employed to police it. In ascending, persons in the forward car have their feet on a level with the heads of those who sit aft near the engine, which, going up, is the propelling power, and going down, the repelling force. The steepest point is Jacob's ladder, a trestle 30 feet high and 300 feet long, the grade 1980 feet to the mile, or 13½ inches to the yard. The lookout here is frightful, and I find myself wondering how I can ever go down this terrible descent. The lower part of the mountain is rich in verdure. There are thick forests, weeds, flowers, delicate ferns and moss of a fineness I have never seen. There is no gradually tapering off of this luxurious growth—on decline from fertility to sterility; but an absolute, a sudden ending of all trace of vegetation. This occurs about 2000 feet from the summit and is as marked as if a line of demarkation had been drawn. They stand edge to edge, the section upon which God has smiled and that aspiring height upon which he seems to have frowned. From here to the summit there is nothing but rocks, from bowlders to pebbles, rocks of mica chist and great conglomerate stones, reminding one of the famed lava beds, and convincing proof to us that five well armed indians could easily keep a company of soldiers at bay for weeks. Here in this barren land bloom Alpine flowers in sixty varieties, long coarse grass and a gray moss, which looks shriveled and unhappy amid its unfriendly surroundings."

The Prussian Harvest.

The London *Times* Berlin correspondent writing on the 22d ult., says: Later and more accurate details now enable me to supplement my despatch of the other day relative to harvest prospects in Germany; and though the fresh particulars now accorded me refer only to Prussia, which has territory in almost every part of the empire, they may safely be accepted as generally applicable. Ever since 1876 it has been the annual custom in Prussia to procure and tabulate careful statistics as to harvest prospects, the result of comprehensive enquiry in the month of July from the agricultural societies of each district. Hitherto, however, crop expectations could only be expressed by a number denoting the proportion of the impending harvest to an average one, and it was found impossible, therefore, to substitute known and definite figures until the absolute results of the year's harvest could be ascertained. That was for the first time achieved last year, thus enabling the crop prospects for 1879 to be tabulated with something like perfect certainty. In preparing statistics for this year, therefore, questions were put as to the likely yield per hectare of the various grain products, it being a rule that returns should be had from every district. The estimates were then all worked up in the Royal Statistical Bureau here, and compared with the ascertained results of last year's harvest, in order to discover the probable yield of 1879 in relation to that of 1878. This elaborate and extensive work will appear in a few days, when all the returns have come in; but as very few only are wanting, the statistical results already attained are not likely to suffer any material alteration. Nor must it be forgotten that the returns were made in July, since which time the weather has decidedly changed for the better; so that the figures, if at all modified, will not be so in a negative sense at least. The result of last year's harvest being taken at 100 kilogrammes per hectare, this year's yield in the various provinces of Prussia will as near as possible, be as follows for the five most important products—namely, wheat, rye, barley, oats, and potatoes.

	Wheat	Rye	Barley	Oats	Pt'to's
East Prussia.....	108	114	97	93	116
West Prussia.....	108	118	98	96	136
Brandenburg	104	84	85	96	99
Pomerania.....	98	104	103	102	109
Posen.....	101	92	81	87	112
Silesia.....	102	104	90	109	95
Saxony	96	95	89	108	110
Schleswig-Holstein.	99	97	114	108	75
Hanover.....	101	100	106	109	98
Westphalia	101	92	101	103	89
Hesse-Nassau.....	100	87	104	97	107
Rhineland.....	104	102	106	108	95
Hohenzollern	94	81	82	97	118
Prussia (state of)...	100	103	94	102	95

This year's wheat crop, therefore, in the Prussian state is estimated as equal to that of last year, a larger return being expected from rye and oats, and a lesser from barley and potatoes, as compared with 1878.

A Colorado Silver Product.

The Denver (Col.) *Times* says: There have been so many conjectures and guesses as to the probable yield of silver from Colorado during the current year that a reporter of the *Times* has been especially detailed to look up this important question, a task that has taken several weeks in its accomplishment, as the yield of the principal mining camp in the state has been carefully estimated from the most reliable data attainable. Several weeks ago the New York *Bullion* quoted approvingly the statement of a California paper to the effect that the ores of Leadville were mainly of low grade, carrying not more than 15 per cent. of lead. It fell to the province of the writer to investigate the matter, and a visit was made to the sampling works of Messrs Eddy & James, in Leadville. Footing up a page of the ore book—the first page at which the book was opened—it was found the several lots entered thereon gave an average of 127 ounces of silver, carrying 35 per cent. of lead. Other pages were footed up with like result, the average not varying more than an ounce or two in either direction. This gave a basis for the calculation of the value of the output of the camp. At that time—now nearly two months ago—the daily product of the camp was about 330 tons of ore. This was about equally divided between the several smelters and sampling works of the city, so that the record of Messrs. James & Eddy was a fair representative of the average value of all the ores sold. This production was considered by the most careful experts of the camp, as about one third of the actual working capacity of the mines then actually developed, the production of which has been prevented by many causes—litigation being the chief. It follows, therefore, that the production of the Leadville mines at that time was in the neighborhood of 40,000 ounces daily—actually mined and reduced to base bullion. This would give a total of 12,000,000 onnces for the year of 300 working days, ending July 1, 1880, worth at the present rate of silver $13,560,000. It must however be remembered that this is but one-third of the present actual working capacity of the mines, and in arriving at a conclusion the probable number of developed mines now lying idle that will be working before the close of the fiscal year must be taken into consideration. It is a low estimate to set down the probable increase in production from this source at 20 per cent. Leaving out the new mines that will probably be producing before the year rolls around, and we have a total of 14,400,000 ounces of silver, having a cash value of $16,272,000. Taking four year as a basis, we may estimate the yield of the state, outside of Leadville, as, in round numbers, $8,000,000. This makes the total production of the state about $24,000,000, of which over two-thirds will be produced in Leadville. The *Times* believes this to be under rather than over the mark, and while it believes the estimate of a New York correspondent—$100,000,000—or even the estimate of some of the papers of the state—$50,000,000—to be extravagant, it has no hesitation in announcing its opinion that, at the close of the current fiscal year, it will be found that the bullion product of the year will be nearer $30,000,000 than $20,000,000, an increase that may be regarded with pardonable pride.

The Straub Mill Co. at the Cincinnati Exposition.

Among the most important articles in Power Hall, the Messrs. Simpson & Gault exhibited several machines useful or necessary to the miller. In the southeast corner the visitor will find the following interesting machines, viz.: The "Snow Flake Middlings Purifier," the "Middlings Mill," the "Champion Smut and Separating Machine," the "Gladiator Dustless Corn Sheller and Cleaner," the "Economic Flour Packer," the "Queen of the South Corn Mill," and other articles, such as buhr stones, mill picks, etc.—*Cincinnati Commercial.*

Messrs. Skinner & Wood, manufacturers of portable and small stationary engines at Erie, Pa., have been crowded with wokr this summer. They received fifty-nine orders in sixty days and shipped thirty engines in August.

Exhaustion of the Soil.

It does not take a very wise man to run down the best of farms. A narrow range of agricultural products, if followed year after year, is sure to do it. One hundred and fifty years ago, upon the Delaware peninsula, it was tobacco, tobacco, tobacco, as the only rotation. Fifty years later, in the Middle States, it was wheat, corn; wheat, corn; and a little later wheat, corn, oats; and still later, wheat, corn, oats, barley. When the soil became too much exhausted for profitable cropping in this manner, it was left untilled until chemical operations steadily going on in the great laboratory of mother earth restored, in some measure, the elements of plant food carried away by the unskilled farmer.

No law of science is more settled and inflexible than this; Whatever elements are carried away from the field by cropping, must in some manner be replaced, if the fertility is kept up.

Some crops remove some elements in greater proportion than others. Some derive their nutriment from or near the surface, as nearly all cereals, turnips, onions, etc.; others go down deeper for the elements that give them active growth, as clover, lucern, beets, parsnips, etc. While the former of these classes exhaust the surface, the latter will grow and thrive when the surface has been exhausted, with a very little start from some stimulating fertilizer. Clover, lucern, beets, parsnips and carrots are all improvers of the soil, by going down with their long tap roots and bringing up the sinking alkaline elements which had already gone down into the soil so far as to be beyond the reach of all surface growing plants.

Hence the importance of a wise succession of crops as a prevention of exhausting the soil. Surface growing crops should be succeeded by deep rooting, as wheat by clover; clover by wheat, corn or turnips. Deep plowing in some soils will, of course, make the elements of plant growth hold out longer, but cannot abviate the necessity of a judicious rotation of crops.

The philosophy of the rotating system lies in applying alkaline substances, as lime, potash, soda, and also phosphates and nitrates to surface growing crops, then following these by deep rooting plants. Thus the greatest amount of good will be derived from these expensive chemicals. Caustic alkalines, as lime, soda and potash, and wood ashes should be applied to the surface, after plowing under sod, or stubble covered with rag or other weeds. They act directly on such organic matter going to decay, and form respectively the nitrates of lime, soda and potash, which are readily convertible into plant food.

Another important point, if we would use fertilizers to the best advantage without impoverishing the land is to supply the plant food which the crop requires, when it needs it for its growth. Ammoniacal plant food, when necessary to be supplied should be applied to the germinating plant to give health, strength and vigor to its leaves. Large leaves are as necessary to a plant, as large and strong lungs to a man. Phosphoric acid, potash and soda should only be applied when wheat, for instance, begins to tiller in the spring, and the plant begins to prepare for the seed. Ammoniacal fertilizers go to make leaves—foliage—while phosphoric acid, potash and soda enter much more largely into the seeds and fruit of plants.

We are fully convinced, both by theory and from experiments, that the country has sustained an immense and unnecessary loss by applying potash and phosphastic substances to wheat in the fall, which had done much more good if they had been sown in March and April when the plants were demanding such food. We do not feed our animals until their natures require it—never a few weeks before. So we should treat our growing crops, unless we are willing to have much of our purchases washed away by long winter rains before the plants require their peculiar nutriment. —*Ohio Farmer.*

A Large Railroad Ferry-boat.

The Baltimore & Ohio Railroad has recently awarded the Harlan & Hollingsworth Co., of Wilmington, Del., the contract for a large ferry-boat to carry trains from the property of the railway at Locust Point to the Philadelphia, Wilmington and Baltimore depot at Canton, near Baltimore. A brief description of the boat and its appointments is as follows: Length, 310 feet; beam, 36 feet 8 inches, hight of deck above the water when loaded, 10 feet; draft of water when loaded (without ballast), 5 feet. In order to conform to the various tides the simple expedient of water ballast has been adopted. Four separate tanks with bulkhead partitions will be made, in the bottom of each of which there will be a valve for the introduction of water, and a pump connection with each compartment, leading to a donkey engine on deck, will be supplied in order to discharge the ballast. The compartments being separate, the ease with which the vessel can be raised or lowered is apparent; on either end can be adjusted to suit to suit the ferry slips and drawbridges without affecting the other. The ballast can also be injected or discharged while the boat is moving, thus saving frequent delay. The hull will be of iron. with a view ef overcoming any ice obstruction in the harbor during the winter season. Double compound engines will be supplied, having 34-inch cylinders and 9-foot stroke, and will work independent when disconnected, so that an abrupt turn can be made by working one paddle-wheel backward and the other forward, after the manner of the new ice-boat, F. C. Latrobe. The wheels will be 22 feet in diameter. The deck will be fitted up with five seperate tracks, having a capacity for a freight train of twenty-seven cars, or of nine passenger coaches, while no matter how small the load, the boat can be perfectly ballasted, owing to the arrangement of the tracks. If a locomotive accompanies the train it will, even when the maximum number of cars is taken on the boat, only make a difference of one car. The contract calls for the completion in 180 working days, the price agreed upon approaching $100,000.

Large quantities of flax are being marketed at Mankato, Minn. The price is $1 per bushel.

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Becker Wheat Brush

Has recently been ordered by the following parties:

Thomas McGee, Perry, Ill.; S. W. Hickox, Springfield, Ill.; Ely & Stetman, Manheim, Pa.; J. M. Brandt, Mt. Joy, Pa.; Jesse Witten, Upton, Pa.; Thos. B. Bryson, Mechanicsburg, Pa.; W. H. Elder, Turin, Ga.; H. Merrill. Newman, Ga.; J. H. Curtis, Oregon, Mo.; East Forest Mill Co., Forest City, Mo.; C. C. Busby, Jerseyville, Ill.; D. O. Johnson, Perry, Ill.; Thos. Williams, Pontiac. Ill.; Grant & Trater, Mooresville, Ind.; Wyson, Kline & Co., Muncie, Ind.; Jas. N. Brooks, La Porte, Ind.; Nordyke & Marmon Co., Indianapolis, Ind.; Simpson & Galt, Cincinnati; Straub Mill Co., Cincinnati; E. P. Allis & Co., Milwaukee, Wis.; J. F. Ellsworth, Williamsburg, Pa.; Thos. Henderson, Spruce Creek, Pa.; Henry & Co., Huntingdon, Pa.; Shenk & Sowers, Ovid, Mich.; Jas. Marriott & Bro., Long Grove, Ky.; Bramble & Miner, Yankton, Dakota; Jas. M. Lee, Chattanooga, Tenn.; F. W. Jaquin, Morris Plains, N. J.; Hugh Bartley, German Valley, N. J.; Jas. Conrad, Castroville, Texas; Sills Bros., Myersburg, Canada.

Foreign Milling and Trade Items.

[From the London Miller for September.]

The great storms of the 2d and 3d of August destroyed many valuable windmills in the counties of Norfolk and Suffolk, England. The loss is very heavy.

The usual yearly meeting of the Association of Austrian millers was held on 25th August, in Vienna. Non-members and visitors were permitted to attend the meeting.

The statistics which have recently been issued show that the exports of wheat and flour from the Austro-Hungarian empire during the first five months of the present year, in comparison with those of the preceding year, are as follows:

	1879.	1878.
Wheat	4,511,320 cwt.	2,192,184 cwt.
Flour	2,366,786 "	1,703,474 "

The Szechenyi Steam Mills company, in Arad (Hungary), realised, in the year ending 1st July, on their paid up capital of fl. 288,200 a net profit of fl. 70,936. The dividend declared is fl. 40 on each fully paid up share of fl. 200, being equivalent to 20 per cent. Last year the dividend was only 12½ per cent.

A new enemy to grain has been discovered in a cargo of barley discharged at Amsterdam. It is a small microscopic maggot, of an unknown species, and besides the injury inflicted on the grain, its presence there produced serious illness and a peculiar eruption on the skin of all who came in contact anywhere with the cargo.

On Wednesday, the 20th of August, the foundation stone of the "Gisela" mill at Budapest was laid in the presence of a numerous assembly. The mill is being built by Mr. Mayer Kraus. The building will probably be completed towards the end of October. The new mill of the Pesth Bakers' and Millers' company is rapidly approaching completion, and will, ere long be at work.

According to official reports of the Austrian harvest the yield of rye will probably be less this year than in 1877 and 1878, but greater than in 1875 and 1876. The wheat crops thus far have returned a fair average, and those which are still standing are of good quality. Barley is everything that could be desired in Bohemia, and the greater portion of the Alpestrine districts, including South Tyrol; but from Moravia, Silesia, Galicia, and Hungary, the reports are unfavorable. Oats are very fine throughout.

On Friday evening, August 29th, a coroner's inquest was held on the body of Mr. Thomas Brennan, miller, Belfast. The deceased was seen by his assistant going about his usual avocation, but suddenly disappeared. The assistant was subsequently horrified at finding the mangled remains of his employer entangled in the machinery. He had the engine at once stopped, but the body of the deceased was so mangled as to be almost unrecognisable. A verdict of accidental death was returned.

On August 14th a destructive fire broke out at the Clara and Belmont flour mills, Ireland, the property of Messrs. Perry & Co., which resulted in the total destruction of the building and its contents. [illegible] originated in connection with the shaft of the middlings purifier, the journal of which got overheated about 11:30 p. m., and before five o'clock on the morning of the 15th ultimo the building was a complete wreck. The mill was five stories high, and contained ten pairs of stones, and the necessary wheat cleaning and flour dressing machinery. The damage done to stock, building, and machinery is estimated at £9,000, £4,500, and £2,000 respectively.

The Vienna seed fair was opened August 25th, by the Austrian minister of commerce, and was attended by 5,300 persons. After the usual greetings, the international committee was constituted. The report presented by Herr Leinkauf, in the name of the Fruit and Breadstuffs exchange of Vienna, in regard to the crops in Austria and Hungary, shows the deficit throughout the monarchy to be, in wheat, 9,250,000; in rye, 7,250,000; and in barley, 5,000,000 hectolitres. The oats crop, on the other hand, has been good, exceeding the average by 2,500,000 hectolitres. In view of the accumulated stocks of last year, it is estimated that only between 3,000,000 and 4,000,000 hectolitres of wheat and about 4,500,000 of rye will have to be imported. The yield of barley will hardly suffice for home requirements, while of oats there will be 3,000,000 cwt. available for exportation.

Australian Agriculture.

A correspondent of the London *Agricultural Gazette* says:

The area under wheat in 1878 9 was 658,413 acres, while in the year before the area was 564,564 acres, showing an increase for 1878-9 of 93,849 acres. The yield this year is 5,715,465 bushels, and as against the previous season's crop of 7,018,237 bushels shows a decrease of 1,302,792 bushels. The average produce per acre is 8.7 bushels for 1879, against 12.4 for 1878. The area under oats is 133,403 acres in 1879, against 105,234 in 1878, with a production of 2,347,997 bushels in the former period, and 2,040,486 in the latter, or an increase in favor of this year's harvest of 307,511 bushels. The average per acre is 17.6 bushels this and 19.4 last year. The production of the year is 415,424 bushels against 378,706 last year—area not given. The total yield of wheat this year is 5,715,465 bushels, from which has to be taken 1½ bushel per acre for seed for 700,000 acres for next year, or 1,050,000 bushels, thus leaving for the consumption of the colony a nominal total of 4,665,465 bushels, but taking into account the large proportion of shrivelled and inferior grain caused by rust and dry weather, the actual quantity must be much less. Estimating our population at 880,000 our requirements at 6 bushels per head will amount to 5,280,000 bushels, or 614,535 bushels more than is available according to these Government agricultural returns. Moreover since the beginning of the year several shipments of wheat and flour were made for the English and other markets, while it was supposed we had a surplus to dispose of. Since the Government statistics appeared, prices have advanced, but brands of flour are selling at £12 per ton, and wheat at 5s.9½d. per bushel. Up to this date, (June 11) we have had no more rain than barely enough for the requirements of the newly-sown grain crops. These, however, so far, are looking well, but will need a good soaking rain before the end of July to give store of moisture in the subsoil for summer use. Late spring rains are to be dreaded, for in this climate they cause over [illegible]at growth and consequent rust. The South Australian Government, I observe, offer $4,000 to any one who may discover a cure for this plague of Australian farmers in rust."

There are coal mines in Germany in which the phenomenon of subterranean waters having a regular ebb and flow has been observed. The scientific academies of Vienna and Berlin are studying it, and look for valuable additions to our knowledge of the earth's interior.

British Grain Trade.

London, Sept. 16.—*The Mark Lane Express* says the few samples of new wheat exhibited in Mark Lane have been wretchedly poor, both in quality and condition. A great deal of barley is so stained as to be unavailable for malting. From 2½ to 2¾ barrels per acre seems to be the average yield of wheat. With, perhaps, some reservation in favor of oats, all spring crops are to a great extent, failures, and peas most especially, while root crops are but little better. Pending the arrival of the new crop, the supplies of old home growth of wheat have been exceptionably small at 150 of the principal towns. Last week farmers delivered a little over 16,500 quarters, against an average of 44,000 quarters the corresponding week for four previous years. The prices for the insignificant quantities offering are unchanged. The principal feature in foreign grain has been the diminution in shipments from America, and comparatively light supplies in Londou, only amounting to 49,000 quarters up to Friday last. The trade has been quiet. Sellers have shown little desire to press sales, being encouraged by the fact that the home crop is lamentably deficient, while the visible crop in America is diminished, though a rise is hoped for by sellers before long. It is impossible to ignore the fact that America must control prices for the present cereal year, although it is more than probable that continental requirements will absorb a large proportion of the available surplus, which at present threatens to glut the United Kingdom markets. Several cargoes of wheat off the coast have been taken for continental discount during the week just passed. In feeding stuffs there has been little noteworthy change. Maize has recovered from the recent slight depression. Barley, owing to present scarcity, has well maintained former values. Oats have receded three pence per quarter in consequence of liberal supplies. To sum up, the present campaign opened up with a very moderate range of prices for all cereal produce. The attention of the trade was centered in America, whose future action, though demanding careful watchfulness, should not be productive of alarm. At the close of the week there was a decidedly better inquiry for American wheat of six pence to a shilling improvement was obtainable, The arrivals at ports of call during the week have been moderate. Wheat off the coast ruled very firm with a good demand, both United Kingdom and continental, at an advance of a shilling to one shilling sixpence per quarter. Maize was in moderate request, at an advance of threepence per quarter. Barley to arrive has been freely offered, and receded slightly. The sales of English wheat last week amounted to 13,655 quarters at 47s 11d per quarter, against 52,592 quarters at 45 shillings per quarter during the same week last year. The imports into the United Kingdom for the week ending September 6 were 176,141 hundredweights of wheat and 216,157 hundredweights of flour. At Mark Lane to-day (Monday) there was a stiff in foreign wheat. Fine American sorts in some cases were one shilling sixpence per quarter higher on the week. Flour advanced a shilling per sack. Barley steady. Maize firm. Oats dull.

Work on the Northern Pacific road west of Bismarck is progressing at the rate of a mile a day, and in about twenty days the iron will be laid down for one hundred miles—the distance that was contemplated in the original contract. It is also announced that the graders are going right along toward the Yellowstone, and that work will be prosecuted without interruption, except from the elements, until the iron is stretched for two hundred miles from Bismarck to the Yellowstone.

WANTED

Two second-hand Porcelain rollers. They must be in fair order. Address,

OSTRANDER, HOPPIN & DEAN,
8 22-6t. Minneapolis, Minn.

PURIFIERS FOR $110.

The Improved French Middlings Purifier, with underblast, to clean the middlings, and suction fan to carry off the dust. In use in twenty different states on all kinds of middlings. Cloth three feet wide by five feet three inches long. Send for descriptive circular with illustrations.

C. G. ROLLINS,
Minneapolis, Minn.

Valuable Mill Property for Sale.

I offer for sale on easy terms to a responsible purchaser, my valuable milling property at West Salem, Wis., together with 320 acres of land belonging to the same. The mill contains 6 runs of stone with abundant power to run five times that number. It is considered one of the best water powers in the state. The mill has been thoroughly overhauled and refitted to make new process flour. Within a short distance of two lines of railroad. Warehouses and office for buying wheat at station.

For full particulars, prices, terms, etc., address
9-5-4t ALEX. McMILLAN
Neshonoc, La Crosse Co., Wis.

A MILL TO RENT

Or a miller wanted. We have a grist mill on the Musquito creek, at Niles, Ohio, with two run flouring burrs, one corn stone, one middling stone, one Wolf's flour packer, purifying bolts, smut machine, and other machinery found in a modern mill, all in first class order and run by water power.

We will rent the mill or hire a good miller to run it. For further particulars call and see or address us at Niles, Ohio.

M. J. SLOAN.
9-12 4t. LYDIA F. BALDWIN,
Executors of Geo. S. Baldwin

A Cone Shaped

COMBINED BRUSH & SMUTTER

AT A LOW PRICE.

Two Machines for the Price of One.

We now make a Combined Brush and Smutter, with a cone shaped cylinder, like the Becker Wheat Brush. The cone is composed of alternate Brush and Smutter Staves, running its entire length; but the brush surface is double the smutter surface. We

Get More Brush Surface from this Combined Machine

than any straight or sectional brushes do in their entire machines; and

HAVE THE ADVANTAGE OF A SMUTTER IN ADDITION.

To parties who wish to scour their wheat a little more than a brush alone will do, we can in all confidence recommend this machine. It has been thoroughly tried in the best mills in the United States, and is said to be

The Best Combined Brush and Smutter

Now in use. It is intended to

Smut, Scour, Brush, Polish and Clean at the Same Time.

It will not disturb or break the bran like a regula Smutter.

Price, capacity, dimensions, etc., same as the Becker brush, which we continue to make, and which to-day stands at the head of all brush machines. We solicit correspondence for this new and useful machine. Address,

EUREKA MFG. CO.,
Rock Falls, Ill., U. S. A.
Manufacturers of the Celebrated Becker Brush.

HOW IT TAKES!

Deal's Board of Trade Flour, Grain and Bolting Cloth Inspector, has now been before the milling public for four months, and has already met with a large sale, and orders are coming in so fast that it taxes the manufacturer to the utmost to keep up with them. The following letters show how it takes with the millers:

KENYON, Minn., Aug. 27, 1879.
H. J. Deal, Esq., Bucyrus, Ohio.,
Dear Sir:—I received the Celluloid trier and case this evening, and am well pleased. It is just the thing. Truly yours, E. WARREN.

WADESBURG MILLS, Mo., Aug. 16, '79.
Mr. H. J. Deal, Bucyrus, O.,
Dear Sir:—I received the celluloid "flour trier and inspector," a few days ago. I am much pleased with it; it fills the bill exactly. I hope the cash for same reached you. Respectfully,
D. C. LEMEN.

ACKLEY, Iowa, Sept, 5th, '79.
Dear Sir—The ivory inspector has reached me at last, and it is a grand success; in fact "Stark A." You only put one O in my name, but almost everyone does it; in fact I might say "they all do it," Respectfully,
T. T. ROOSEVELT.

WRIGHTSVILLE, Wis., Sept. 8, 1876.
H. J. Deal, Esq., Bucyrus, O.,
Dear Sir:—The ivory grain and flour inspector just received. I am well pleased with it. Will you please send me by Express, C. O. D., one Corundum polisher, which I see by advertisement in NORTHWESTERN MILLER, costs $3.50, sent by express. Respectfully yours,
J. G. KIMBALL.

FRANKFORT, Ky., Sept. 4, 1879.
H. J. Deal, Esq., Bucyrus, O.,
Dear Sir:—Your postal card and the "Ivory Board of Trade, Flour, Grain and Bolting Cloth Inspector" came to hand all right. The inspector looks well. Yours respectfully,
GEO. B. MACKLIN.

ZANESVILLE, Ohio, Sept. 3, 1879.
Mr. H. J. Deal, Bucyrus, O.,
Dear Sir:—The Ivory Board of Trade Flour, Grain and Bolting Cloth Inspector came to hand to-day. I am very much pleased with it.
Yours Truly, W. A. BEAUMONT,

Dakota Territory---Facts in Relation to Its Early History.

The Winona Republican publishes the following letter from Judge Flandrau, which contains some interesting historical reminiscences of the Territory of Dakota, the most of which will be new to the general reader:

Edward Ely, Esq., Winona, Minn.

DEAR SIR: In response to your letter of August 15, 1879, asking me for information concerning the origin and early history of the town of Flandrau, in Dakota Territory, I am glad to say that I am in possession of the facts you seek to know, and that I give them to you with pleasure because there seems to be a good deal of misapprehension among the people of that place as to its origin. Being somewhat of an "old settler" I take great interest in all that concerns the history of this portion of the Northwest, and like to see the facts correctly stated. It happened thus:

In the early part of the year 1857 we all felt pretty sure that the state of Minnesota would be admitted into the union upon what we then called the "north and south" line of division, which was the line finally adopted. There was a strong party in favor of a state upon an east and west line of division, which would, if adopted, have cut the territory in two, on a line just north of Minneapolis, making the State out of the south portion, and leaving the Territory or remnant north of that line.

You will remember that when Wisconsin was admitted on the western boundary of the St. Croix, it left all the country west of that river in an unorganized condition, and that the inhabitants held a convention and elected Gen. H. H. Sibley as a delegate to congress as an experiment, and that he was admitted to a seat, and the act of congress of 1849 was soon after passed organizing the territory of Minnesota. We anticipated just such a condition of things on the admission of Minnesota, and concluded we would occupy the territory west of the new state, send a delegate to congress, secure the capitol, university, penitentiary and other public buildings at our own towns, and make a good speculation out of the enterprise. To enable us to accomplish this a corporation was organized under an act of the legislature of the territory of Minnesota, passed May 23, 1857, which was entitled "An act to incorporate the Dakota Land company." The original incorporators were W. H. Nobles, J. R. Brown, A. G. Fuller, S. A. Medary, Samuel F. Brown, James W. Lynd, N. R. Brown, F. J. De Witt, and F. Freidenrich. The corporation was vested with full powers for the purchase and entry of land, and the doing of anything that was necessary to establish towns and cities anywhere in the territory or future state.

Under this organization agents were sent into the southwest and the sites for several cities selected, among which were Sioux Falls city, Medary and Flandrau, all on the Big Sioux. Sioux Falls was designed for the capital of the future territory, and the other places were to share the governmental prizes. Mr. A. G. Fuller was elected a delegate to congress, and went to Washington, but was never admitted to a seat, notwithstanding the precedent of General Sibley's admission in 1848 from Minnesota. Sioux scrip was laid upon lands, but at a subsequent date was withdrawn. Very considerable improvements were made by the company at all the places, but especially at Sioux Falls city, where a capitol building was erected, a hotel built, and a printing office established, with Sam Albright as editor, and a very handsome newspaper was published there, called the Dakota Democrat, of which I now have a copy of the issue of August 5th, 1859, being Vol. 1, No. 2, of the paper.

The efforts of Mr. Fuller in Washington, and other friends of the organization, failed to procure a territorial government for Dakota for several years, and my opinion has always been that the delay was on account of all the members of the Dakota Land company being Democrats, and congress expecting a change of administration in 1860 destined to postpone the erection of the territorial government until the other party could control it. At any rate they did postpone it until March 2, 1861, when the act was passed organizing Dakota territory and leaving the selection of the seat of government to the governor.

During this delay, however, a serious state of things existed. The people of the territory, becoming impatient at the delay, organized a state government, elected first Henry Masters and then Sam Albright, governor, chose a legislature, which assembled at Sioux Falls and passed laws which were duly printed and approved by Gov. Albright, and demanded admission to the Union "on an equal footing with the original states;" but congress was inexorable, and all the time and money spent by the company and others in this direction were lost.

When the Sioux outbreak occurred in August, 1862, all the improvements at Sioux Falls, Flandrau and Medary were burned by the indians, and the places were virtually abandoned by the company. The United States government made reparation to the company for its losses, which enabled it to make its first and only dividend on its capital stock.

This is briefly the history of the town of Flandrau, up to the time when its present title was made by new comers, and about which I know very little. Sioux Falls city, as its name indicates, was called after the falls in the Big Sioux, at which place it is located. Medary is named after Governor Samuel Medary, who was then governor of the territory of Minnesota, and the Dakota land company did me the honor to name the town of Flandrau after me.

The facts given you are largely from recollection, but they are substantially correct in all essential particulars. I would suggest however, that Mr. Alpheus G. Fuller, who now resides at or near Yankton; Mr. F. G. DeWitt, who I believe, also resides in Yankton, or somewhere on the Missouri in the territory; Captain Fisk, who is now in Pembina; and Daniel F. Browley, who, I believe, resides at Winnepeg, all were intimately connected with the operations of the Dakota land company, and can undoubtedly give you accurate information as to the history of the town of Flandrau, and being old settlers, they will willingly recount the experiences of the past. Respectfully yours,

CHAS. E. FLANDRAU.

The grain receivers of this city are mad. The country shippers who have been sending grain to this market are swearing the atmosphere blue, and the grain receivers in St. Louis and Milwaukee and the officers of the railroads running into those cities are beaming with delight. The grain receivers here have been complaining bitterly of the scaling up of the grades of spring wheat by the inspection department, and they are now complaining with indignation of the track charges on grain, which are directly in the interest of the elevators, and which operate as a heavy tax on the business of selling grain on the track, which is a large business, and a very important part of the grain trade of this city.—*Chicago Times.*

"Notice to Millers!"

It is an established fact that flour can be made cheaper, that the wheat will give a larger yield, and that the flour will command a higher price when made by what is called "New Process." Recognizing this, we have made a speciality of changing mills from

OLD TO NEW PROCESS.

Parties desiring to change their mills would do well to write us, and we will call on them and give estimate for complete change, including EVERYTHING, and not only guarantee work, but

Quality of Flour

when completed, relieving them from all responsibility. We also furnish drawings, specifications, millwrights, and all the latest improved machinery for

"New Process and Gradual Reduction Mills"

of any capacity. Correspondence solicited.

WILCOX, SHINKLE & MILLER,
Pittsburgh, Pa.

The *American Miller* for April contains an official list of members of the Millers' National Association. On examining the list we find that it numbers over 700 firms, representing over 3,000 run of buhrs. We also find that over one-fourth of them, representing nearly 1,500 run of buhrs, are purchasers of our Diamond Mill Stone Dressers. They expect large additions to their membership—we also expect large additions to our list of purchasers, both from outside and inside of the association. Why? Because we have the best buhr dressers in the market.

GRISCOM & Co., Pottsville, Pa.

Manufacturers and owners of patents of McFeely's improved buhr dressers.

C. C. TAYLOR,

of Appleton, Wis., inventor of the **"Worlds Turbine"** wishes the address of every miller and manufacturer in the United States that is using water power.

THE "SCREW TOP"
MAIL SAMPLE ENVELOPE

For transmitting through the mails Flour, Sugar, Meal Bran, and other powdered substances; Nails, Needles, and sharp pointed instruments, at third-class rates, of one cent per ounce. Made entirely of tin. The best and most convenient mail sample package now offered. Approved by the Postmaster General. Send six cents in stamps for sample. $5.00 per 100.

MCCONNELL & BERNATZ,
317 Liberty St., Pittsburgh, Pa.
Flour Commission Merchants.

WARRANTED!!

LYE & ZIMERLE'S IMPROVED ANTI-INCRUSTATION COMPOUND FOR STEAM BOILERS.

We guarantee this preparation to neutralize the fresh deposits of lime and other mineral, thus stopping new formations of scale, and to gradually bring out the old scale. We earnestly solicit all users of steam to give it a trial.

Prices reduced to 50 cents per gallon in barrels, half-barrels and quarter-barrels. Correspondence solicited and references furnished. Please give diameter and length of boiler, well or river water, and kind of mineral as near as possible. Address,

LYE & ZIMERLE, Delphos, Ohio.

DUC'S
Improved Elevator Buckets.

BEST IN USE!

This is the only **Scientifically Constructed** bucket in the market. It is struck out from charcoal stamping iron. "No corners to catch." "No seams to burst." "No interior corners to clog up." It runs with great ease, and **half the power** of the old style bucket. Will outwear half a dozen of them.

Prices Reduced.

T. F. ROWLAND,
Sole Manufacturer,
Brooklyn, N. Y.

ROBINSON & CARY, Agents,
St. Paul, Minn.

STOP! STOP!! STOP!!!
PURCHASING
Middlings Purifiers

Until you send your address to Andrew Hunter, who will explain the reason why and show you how to save from $50 to $300 on the purchase of each machine. "A dollar saved is a dollar earned." Members and those who are not members of the Millers' National Association will hereafter reap the benefit of the decision. Said decision prompted Hunter to reconstruct and simplify his machine, placing it outside of all possibility of infringement from reissues of old patents or any invention in use. Hunter has had the good fortune in simplifying his machine to enable him to compete in price with the poorest machine on the market. Hunter's purifiers are fully protected by his own patents, he having spent the past 18 years experimenting on machines for separating by specific gravity. He owns now over 15 patents, which cover fully all the principles used in his machines. Consequently there is no necessity of purchasing a license, or bolstering up with the aid of old patents or reissues. He guarantees better work and greater capacity than any machine in the world.

ANDREW HUNTER,
471 West Washington St.,
Chicago, Ill.

ALLEN'S PATENT

"AUTOMATC GRAIN WEIGHER AND REGISTER."

A New and Useful Machine for Weighing Grain in the Running Stream, and the Only Successful one Ever Invented.

One of these machines set over the hopper shows the miller the exact quantity of grain ground in an HOUR, A DAY, OR A YEAR.

It is entirely automatic, requiring no attention, and is perfectly accurate; not varying five pounds—from the correct weight—in a hundred bushels.

Being made entirely of iron and steel, it is not affected by dampness; and as there are no springs or wheels or other contrivances which are likely to get out of order, it will last a long time. Those parts which are liable to wear are all made of hardened and polished steel, and will not change for years.

No miller should be without one or more and no miller WILL BE who has ever tried or seen one in operation.

They have as yet only been made in small sizes, to weigh from five to three hundred bushels an hour, but can be increased to any capacity required.

They are of small size, light and easily handled, and can be put in a very small space: a machine which will weigh and register three hundred bushels an hour occupying less than eighteen inches square.

THEY ARE SMALL, SIMPLE, DURABLE, INEXPENSIVE.

For further particulars, address,

DR. WM. H. ALLEN,
No. 18 West 11th St., N. Y. City.

5 23w26

GLORIOUS NEWS

FOR MILLERS.

MONOPOLISTS, BULLDOZERS, AND VENDERS OF WORTHLESS MACHINES

Who have long imposed on the milling public, must now give way to Hunter's latest improved purifier. The milling interests of the United States will not admit of exorbitant prices, nor will manufacturers be able to pay high-toned millwrights 35 per cent. for selling or recommending their machines. Hunter's new purifier retains all the superior qualities of the old, but it has been simplified to such an extent that he is enabled to reduce the price nearly one-half; furthermore, he is not compelled to take out a license or pay royalty, neither has his new machine anything in common with other purifiers. He has recently invented a device for cleaning the cloth, which proves far superior to any brush operated under the screen. This device renders it impossible for middlings to stick in the meshes of the cloth, or for adhesive particles to accumulate on the screen.

ANDREW HUNTER,
471 West Washington St.,
Chicago, Ill.

THE SALEM BUCKET

Is the latest **Really Scientific** one. Light, Strong, Smooth, faultless shape. It is the FAVORITE wherever it goes.

Takes its load easy. Empties clean. Corners rounded inside and out. Body in one piece. Band in one piece. Is the favorite wherever it goes. Thousands already in use.

Prices on application and sample mailed on receipt of 15 cents for postage.

W. J. CLARK & CO.,

Sheet Metal Workers,

SALEM, OHIO.

Mill Ventilators, Grain and Flour Scoops, Elevator Bolts Conveyors, Etc.

Thos. Bradford & Co.

CINCINNATI, OHIO,

Manufacturers of

Select French Buhr Mill Stones

Portable GRIST MILLS.

AND Smut Machines.

And Importers of the Heavy

Genuine Dufour & Co.'s Dutch Anchor Brand

BOLTING CLOTH.

Dealers in Leather & Gum Belting,

AND MILL FURNISHINGS OF ALL KINDS.

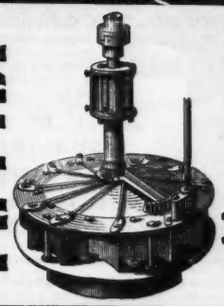
Address,

THOMAS BRADFORD & CO.,
61 Wanut St., Cincinnati, O.

☞ Send for Price List.

MANUFACTURERS OF THE

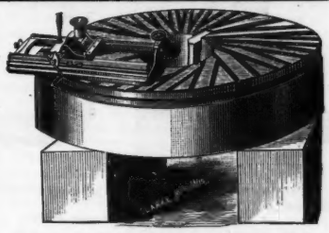
LEFFEL TURBINE



WATER WHEELS.

We use only the best materials and our long experience in the **Manufacture** *of this Wheel enables us to furnish them in best style of workmanship and at the* **lowest** *price. Before purchasing elsewhere address,*

POOLE & HUNT,
BALTIMORE, MD.



IMPORTANT TO MILLERS!

BENTON'S PATENT

Diamond Mill Buhr Dresser

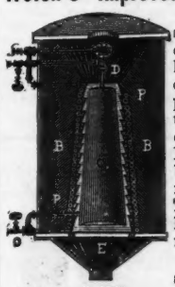
Adapted to fine, or coarse, light or heavy face, cracking, fleecing off smoothly, or furrowing level and true to any angle. It works perfectly, and is adjustable to all kinds of stone dressing required by millers. It saves time and money, improves the quality and quantity of the flour and makes a light offal.

The cost of mill picks, with the rubbing, grinding, tempering and express charges all saved by using this machine.

For particulars apply to

Benton Diamond Buhr Dresser Co.,
La Crosse, Wisconsin.

Welch's Improved Wheat Haeter.



The peculiar construction of this Heater insures the even heating of every grain of wheat. The wheat passes down between the notched cone and conical coil of pipe. B B is packed with Asbestos, which prevents radiation of the steam. A trial of 30 days allowed. Satisfaction or no sale.

Manufactured and sold by

Pat. Aug. 5, 1879. **A. B. BOWMAN,**
8.8wtf 703 Market St., St. Louis, Mo.

A superior steaming attachment, for use at pleasure, is furnished with each machine.

J. R. Cross,

PRACTICAL MILLWRIGHT AND MILL BUILDER.

Plans, Specifications and Estimates Furnished.

Dealer in All Kinds of

Flour Mill Machinery, Superior Bolting Cloth,

And Importer of

French Violet Stock

MILL STONES.

217 Washington Avenue, South,
MINNEAPOLIS.....MINN.

CONTRACTS MADE

—FOR—

CHANGING MILLS

OF ANY CAPACITY

FROM THE OLD TO THE NEW PROCESS,

INCLUDING MILLWRIGHT WORK.

Grade of Flour Guaranteed

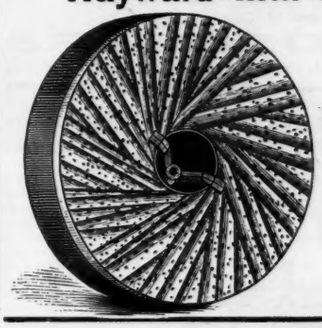
In Every Instance. Address,

WILCOX, SHINKLE & MILLER,

Correspondence Solicited. Pittsburgh, Pa.

Hayward Mill Furnishing Works.

Established 1824.



GEORGE R. CALE,

Successor to GEO. L. HAYWARD.

Importer of and Dealer in

FRENCH BUHR MILL STONES,

PORTABLE MILLS,

Dufour & Co.'s and H. Bodmer's Celebrated

Bolting Cloth.

Mill Furnishing in General.

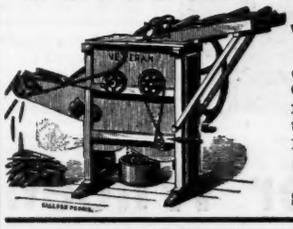
Office and Warehouse:

66 River St., CLEVELAND, O

Veteran Corn Sheller,

FOR POWER AND HAND,

With Fan, Feed Table, Band Wheel & Crank.



Capacity, 250 to 300 bushels of shelled corn a day. A thorough SHELLER, SEPARATOR and CLEANER. The best and most popular machine for the price ever offered. Just the thing for a custom mill. Write for prices.

Power and Hand Corn Shellers of all Sizes to suit all Wants.

HORSE POWERS, JACKS, Etc.

Write for Descriptive Circulars and Prices. Address,
SANDWICH MANUFACTURING CO., Sandwich, Ill.

Chas. KAESTNER & CO.

General Mill Furnishin

—AND—

Manufacturers

of the Patent

"Kaestner" Portable BUHR **Stone Mills**

Especially for **REGRINDING MIDDLINGS.**

Our mills possess many valuable improvements, all covered by patents, making them the VERY BEST MILL in the market. They took the first premium at the Centennial Exhibition, Philadelphia, 1876. Three thousand of our mills in operation all over the country. Every mill warranted to give entire satisfaction, or money refunded. Reduced prices.

Send for circular and price list.

63 SOUTH CANAL STREET,
CHICAGO, ILL.

STILWELL'S PATENT

LIME EXTRACTING

Heater & Filter.

Indispensible to Economy in use of Steam.

Prices Greatly Reduced!

STILWELL & BIERCE M'FG CO.
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THIS SAWING MACHINE,

operated by one man, will saw off a 2-foot log in 2 minutes. Warranted the best in use. Just the thing for sawing trees into saw logs, rail cuts, shingle, or stave blocks. Circular free.

Wm. GILES, 741 W. Lake st., *Chicago, Ill.*

ESTABLISHED 1837

VICTOR BISHOP & CO.

IMPORTERS OF

DIAMONDS AND CARBON

FOR

MILLSTONE DRESSERS

47 NASSAU ST. NEW YORK

For Truing the Face and Furrows of Millstones, Cutting down high Spots, and restoring the Burrs to their natural grit, it is far superior to **EMERY, CORUNDUM,** or any other material that has yet been used for this purpose. It is the only Tool used with **Water.** Cuts faster, lasts longer, and will remove the **glaze** in one-half the time it takes with other Hand Tools. Too large to send by mail. **Price, $3.50.**

MORRISVILLE, Bucks Co., Pa.

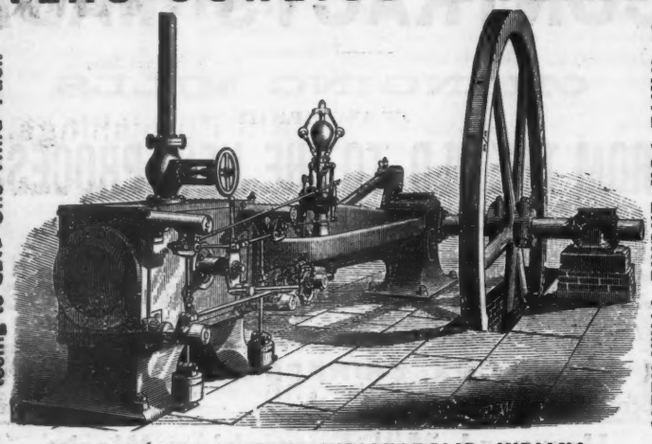
MESSRS. TETER & ALLEN, Philada., Pa.—We gave your Black Diamond Hand Tools a fair trial. They are far superior to the Corundum Tool, cuts much faster and leaves a smoother surface, and still preserves the natural grit of the stone. Respectfully, HOWELL & SON.

Sold by Mill Furnishers throughout the United States and Canadas.

TETER & ALLEN, Proprietors,
DEALERS IN FLOUR MILL SUPPLIES,
404 Commerce St. Phila., Pa., U.S.A

ATLAS-CORLISS ENGINE!

Will Replace Ordinary Engine, Guaranteeing to Save One-Third Fuel.



WRITE FOR ENGINE PAMPHLET.

ATLAS ENGINE WORKS, INDIANAPOLIS, INDIANA,

Builders of All Classes of

ENGINES AND BOILERS

We build *The Best Farm Engines and Small Engines* for Warehouses and Elevators.

The Best and the Cheapest.

THE CELEBRATED CRAIK

Perspective View of Wheel.

Turbine Water Wheel.

THE ONLY WATER WHEEL IN THE WORLD THAT GIVES AS HIGH A PERCENTAGE ON PARTIAL AS ON FULL GATE.

We invite the attention of Millers and others using water power to our wheel. It is the cheapest wheel for a given power in the market, and is guaranteed to give entire satisfaction, or it may be returned at our expense. It excel all others in the following points:

1. Both buckets and chutes are made of wrought iron, giving great strength to the wheel and perfect smoothness to the bucket, avoiding both breakage and loss of power from undue friction of the water in passing through the wheel.

2. From the peculiar construction and shape of the buckets, the water is concentrated on the wheel at its highest possible velocity at either full or part gate, thus giving as good a percentage at partial as at full gate, which cannot be obtained by any other wheel.

3. The chutes are cast stationary in the case, so that there is no possibility of their getting loose or leaking. At the same time the moveable gates are so constructed that the full force of the current of water is thrown by the chutes against the buckets, where it is spread out in a thin sheet when the wheel is running at part gate, thus realizing the same percentage of power as when the wheel is running at full gate.

As we wish the superiority of these wheels to be fully demonstrated to the satisfaction of every purchaser, we offer to ship them to any part of this or any foreign country, to any responsible party, at our own expense, and allow a sufficient time to prove the claim made for them, and in case of non-satisfaction will bear the expense of re-shipment.

This wheel has thoroughly demonstrated its superiority in practical use over all others, and arrangements have now been made to manufacture it under improved plans which will enable the wheel to be sold at about one-half the price of other wheels.

For Circular and Price List send to

CRAIK TURBINE MANF'G CO., La Crosse, Wis.

We also Manufacture the

Celebrated Craik Driver for Mill Stones!

The Only Perfect Frictionless, Self-Adjusting Driver in the World.

When used in connection with CRAIK'S PATENT BAIL, we Guarantee a Better Grade and Greater Yield of Flour with this device than with any other in the market. The change can easily be made on any kind of spindle without altering its present form, and competent men will be sent to any part of the Union to make the change, sufficient time being allowed to test its merits before paying for it.

Send for Circular. CRAIK TURBINE MANF'G CO., La Crosse, Wis.

THE GREEN MOUNTAIN

Turbine Water Wheel

is the best in the world for low falls and back water. Its great durability, *quick motion*, and great power make it the giant wheel of the age.

THE

SUNLIGHT

MILL DRESS

The finest dress in use, and will make the whitest and most flour and broadest bran of any dress known, and require less power.

Will guarantee to keep the face and furrows free from glaze for three cents per day, and clean a pasted mill in 15 minutes for three cents cost, with my discovery. Mill in motion, no wet stones, and a benefit to the product.

J. W. TRUAX Essex Junction, Vermont.

THE DANE

MILL BUHR DRIVER

It produces better results than any Driver in use. Send for circular to

J. C. Dane, or *John James & Co.*,

3-14wtf La Crosse, Wis.

The Nicollet House,

Minneapolis, Minnesota.

Having purchased this day the furniture and all interests of the late firm of McKibben & Vosburgh in the Nicollet House, we respectfully announce to the traveling public that we shall endeavor to restore and materially enhance the reputation which the house had under our former management, with the assurance that at the Nicollet will be found every requisite and comfort of a first class hotel. Prices graded from $2 to $3 per day.

F. S. GILSON & Co., Owners and proprietors.

Minneapolis, Aug 12, 1877. sep7tf

$1500 To $6,000 a year, or $5 to $20 a day in your own locality. No risk. Women do as well as men. Many make more than the amount stated above. No one can fail to make money fast. Any one can do the work. You can make from 50 cents to $2 an hour by devoting your evenings and spare time to the business. It costs nothing to try the business. Nothing like it for money making ever offered before. Business pleasant and strictly honorable. Reader, if you want to know all about the best paying business before the public, send us your address and we will send you full particulars and private terms free; samples worth $5 also free; you can then make up your mind for yourself. Address,

GEORGE STINSON & CO., Portland, Maine.

CORUNDUM TOOL. Patented Jan. 23, 1877.

A Tool FOR CUTTING, LEVELING and POLISHING the FURROWS and FACE of MILL STONES. Many of the best mills in America are using them. For Facing down high places on the buhr this Tool has no equal, and can be done much better, and in one-sixth the time, than with the mill pick. Over 5,000 Millers using them, and the demand constantly increasing. Price $3.50; or sent by mail to any part of the United States, postpaid, for $3.85. Manfacutured by WEED & CO., Dayton, Ohio. nov9eowtf

SUBSCRIBE FOR

—THE—

Northwestern Miller

THE RIVET BUCKET

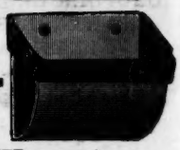
(For Grain.)

200,000 in Use.

THE RIVET

(Mill) Bucket.

250,000 in Use.



THE CORRUGATED

Belt Bolt

This saves 10 to 25 per cent. in the wear of the belt. Sample sent.

These goods, of extraordinary merit and cheapness, together with all mill and warehouse furnishings sold by

N. HAWKINS & CO., Supply House,

224 Washington St., Chicago.

Send for Lists and Prices of needed articles

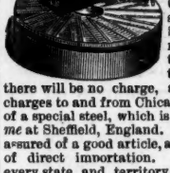
JOHN C. HIGGINS,

Manufacturer and Dresser of

MILL PICKS

164 W. Kinzie Street,

CHICAGO.



Picks will be sent on 30 or 60 days' trial, to any responsible miller in the United States or Canada, and if not superior in every respect to any other pick made in this or any other country, there will be no charge, and I will pay all express charges to and from Chicago. All my picks are made of a special steel, which is *manufactured expressly for me* at Sheffield, England. My customers can thus be assured of a good article, and share with me the profits of direct importation. References furnished from every state and territory in the U. S. and Canada. Send for Circular and Price List.

BOOKWALTER ENGINE.

Compact, Substantial, Economical, and Easily Managed. Guaranteed to work well, and give full power claimed. Engine and Boiler complete, including Governor, Pump, etc., (and boxing) at the low price of

3-Horse Power - - $215.00
4½ " " - - 245.00
6½ " " - - - 315.00

Put on cars at Springfield, O.

JAMES LEFFEL & Co., Springfield, Ohio.

Gratiot's Improved

WHEAT HEATER!

thoroughly and properly toughens the bran on the *hardest* or *driest* wheat; heats the wheat *evenly*, and improves the flour and milling generally, as no other Heater in the market does. Send for Circular,

GRATIOT BROS.,

Platteville, Wis.

IMPORTANT TO MILL-OWNERS!

PAMPHLET containing REDUCED PRICES and Testimonials of Merit, also Catalogue of Milling Supplies, sent free.

The GATE IS TIGHT - SHUTTING, EASILY OPERATED, and has no Complicated Gears or Traps concealed under cover.

It is extensively used in this and Foreign Countries!

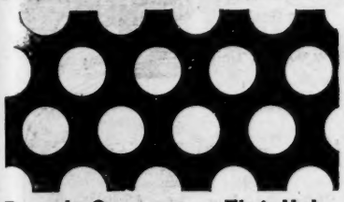
ESTIMATES FURNISHED FREE

For Shafting, Pulleys, Hangers, and Cog Gearing, or

MILLS COMPLETE

22a *Office: 23 South Beaver st., York, Pa.*

Perforated Metals.



Round, Square or Flat Holes

—IN—

Copper, Iron, Brass or Zinc.

Any width up to fifty inches wide, and all thicknesses up to one-sixteenth.

LIDGERWOOD MANF'G CO.,

6.27w26t 96 Liberty St., NEW YORK.

POOLE & HUNT, BALTIMORE.

MANUFACTURERS OF

THE POOLE & HUNT LEFFEL TURBINE

WATER WHEELS,

MACHINE MOULDED MILL GEARING,

SHAFTING, PULLEYS AND HANGERS,

STEAM ENGINES AND BOILERS,

MIXERS FOR FERTILIZERS AND CHEMICALS.

CAREY'S

DOUBLE ANCHOR

BOLTING CLOTHS.

Best in the Market.

SAMUEL CAREY,

SOLE IMPORTER,

No. 17 Broadway, - New York.

$300 A month guaranteed. $12 a day at home made by the industrious. Capital not required; we will start you. Men, women, boys and girls make money faster at work for us than at anything else. The work is light and pleasant, and such as any one can go right at. Those who are wise who see this notice will send us their addresses at once and see for themselves. Costly outfit and terms free. Those already at work are laying up large sums of money. Address. TRUE & CO., Augusta, Maine.

THE THOMPSON

Turbine Water Wheel.

The most scientific application of the water ever made.

This Wheel Has No Superior in the World.

AWARDED

Bronze Medal and Diploma

—AT—

CENTENNIAL EXHIBITION.

Send for Descriptive Circulars. Address:

THOMPSON IRON WORKS,

1.10w52t Union City, Pa.

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Chicago, Milwaukee & St. Paul

RAILWAY

IS THE VERY BEST LINE TO

Chicago, Milwaukee, St. Paul and Minneapolis,

AND ALL POINTS IN

Wisconsin, Northern Iowa, Minnesota, Dakota, Manitoba, and the Black Hills,

NEW YORK, PHILADELPHIA, BALTIMORE, WASHINGTON,

New England, the Canadas, and all

EASTERN AND SOUTHERN POINTS.

2 ROUTES

—AND—

3 DAILY TRAINS

—BETWEEN—

Chicago, St. Paul and Minneapolis

The Chicago, Milwaukee and St. Paul Railway is the only Northwestern Line **connecting in same Depot in Chicago** with any of the Great Eastern and Southern Railways, and is the most conveniently located with reference to reaching any Depot, Hotel or place of business in that City.

Through Tickets and Through Baggage Checks to all Principal Cities.

Steel Rail Track, thoroughly ballasted, free from dust. **Westinghouse Improved Automatic Air Brake, Miller's Safety Platform and Couplings** on all Passenger cars. **The Finest Day Coaches and Palace Sleeping Cars**

This road connects more **Business Centers, Health and Pleasure Resorts**, and passes through a finer country with grander scenery, than any other Northwestern line,

A. V. H. CARPENTER, Gen'l Pass. and Ticket Agt.

S. S. MERRILL, General Manager. **JOHN C. GAULT,** Ass't Gen'l Manager.

Chicago, St. Paul & Minneapolis Ry.

(Formerly West Wisconsin,)

AND

CHICAGO & NORTHWESTERN RAILWAY,

Forming a Through Line without Change of Cars, between

ST. PAUL & CHICAGO, BELOIT, MADISON & BARABOO and making Close Connections at CHICAGO for NEW YORK, PHILADELPHIA, BALTIMORE, WASHINGTON, NEW ENGLAND, THE CANADAS and all EASTERN and SOUTHERN STATES.

It is the ONLY LINE running

PULLMAN PALACE CARS

And making direct connections with St. Paul & Pacific, Northern Pacific, and St. Paul & Duluth Railways.

IN UNION DEPOT AT ST. PAUL.

STEEL RAIL TRACK, thoroughly ballasted and free from dust; WESTINGHOUSE AIR BRAKE, MILLER SAFETY PLATFORMS and COUPLINGS on all Passenger Cars.

NEW AND ELEGANT DAY COACHES

In connection with

Pullman Palace Cars!

ON ALL TRAINS.

Two Through Express Trains Daily.

CONNECTIONS.

AT MERRILLAN JUNCTION, for Green Bay, Grand Rapids, Fond du Lac, Appleton, Oshkosh, and all points on Northern Lake Michigan.

AT WIS. VALLEY JUNCTION, for Stevens Point, Wausau, and all points on Wisconsin Central Railroad.

DON'T FORGET

to PURCHASE TICKETS via.

Chicago, St. Paul & Minneapolis and Chicago & Northwestern Railways,

in order to save expense, trouble and annoyance incident to transfer of baggage at St. Paul, and enjoy the

BEAUTIFUL SCENERY

OF THE

St. Croix & Baraboo Valleys,

Including DEVIL'S LAKE, MADISON, and BELOIT, WISCONSIN.

F. B. CLARKE, Traffic Manager, St. Paul. W. H. WINTER, Gen'l Sup't, Hudson, Wis

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Toll Cards With table for taking one-eighth toll and making ample deduction for cleaning, etc. Grists figured out in a few seconds at any number of pounds of flour per bushel. Two for 50 cts; 5 for $1. LORD BROS., Waupaca, Wis.

The Chicago & Northwestern Railway

IS THE

Oldest, Best Constructed Most Progressive, best Equipped, Hence

THE MOST RELIABLE RAILWAY CORPORATION

Of the Great West.

It is to-day, and will long remain the

Leading Railway of the West and Northwest.

It embraces under one Management

2,158 Miles of Road

And forms the following Trunk Lines:

"CHICAGO, COUNCIL BLUFFS & CALIFORNIA LINE,"
"CHICAGO, CLINTON, DUBUQUE & LACROSSE LINE,"
"CHICAGO, SIOUX CITY & YANKTON LINE,"
"CHICAGO, FREEPORT & DUBUQUE LINE,"
"CHICAGO, LA CROSSE, WINONA & MINNESOTA LINE,"
"CHICAGO, GREEN BAY & MARQUETTE LINE."
"CHICAGO, MILWAUKEE & LAKE SUPERIOR LINE,"
"CHICAGO, ST. PAUL & MINNEAPOLIS LINE."

The advantages of these lines are

1. If the passenger is going to or from any points in the entire West and Northwest, he can buy his tickets via some of this Company's lines and be sure of reaching his destination BY IT OR ITS CONNECTIONS.
2. The greater part of its lines are laid with Steel Rails; its road bed is perfect.
3. It is the short line between all important points.
4. Its trains are equipped with the Westinghouse Air Brake, Miller's Platform and Couplers, and the latest improvements for comfort, safety and convenience.
5. It is the only road in the West running the celebrated Pullman Hotel Cars between Chicago and Council Bluffs.
6. It is the only road running the Pullman Palace Sleeping Cars either way between

Chicago and St. Paul, Green Bay, Freeport La Crosse, Winona, Dubuque, McGregor, Milwaukee.

7. No road offers equal facilities in number of through trains, equipped with Pullman Palace Sleeping Cars.
8. It makes connections with all lines crossing at intermediate points.

The popularity of these lines is steadily increasing and passengers should consult their interest by purchasing tickets via this line.

Tickets over this route are sold by all Coupon Ticket Agents in the United States and Canadas.

Remember, you ask for your tickets via the Chicago, & Northwestern Railway, and take none other.

For information, Folders, Maps, etc., not obtainable at Home Ticket Office, address any agent of the Company or

MARVIN HUGHITT, Gen'l Manager, Chicago. **W. H. STENNETT,** Gen'l Pass. Ag't. Chicago.

St. Louis, Minneapolis & St. Paul

SHORT LINE,

Composed of the

MINNEAPOLIS AND ST. LOUIS, BURLINGTON, CEDAR RAPIDS and NORTHERN,

—AND—

Chicago, Burlington & Quincy RAILWAYS,

Making the Shortest Line and the Best Time between SAINT. LOUIS,

and all points in the South, Southwest and Southeast, MINNEAPOLIS AND ST. PAUL,

The Summer Resorts and Lake Country (Most prominent of which are Lake Minnetonka and White Bear Lake) of the Northwest, and Great Lakes

Also New and Direct Line Between

Minneapolis, St. Paul and Chicago

In connection with the

CHICAGO & NORTHWESTERN R'Y

Via Cedar Rapids to and from

CHICAGO, NEW YORK, BOSTON, PHILADELPHIA, And all points East.

Tickets on sale at all the important Coupon Ticket Stations throughout the South, East and West.

PULLMAN PALACE SLEEPING CARS

of latest make and improvements on through express trains.

BAGGAGE CHECKED THROUGH.

TWO DAILY TRAINS EACH WAY.

Tickets and Sleeping Car Berths can be secured in

MINNEAPOLIS,

at City Ticket Office, No. 8 Washington Ave., W. G. TELFER, Agent.

And at St. Paul and Pacific Depot.

In St. Paul at 116 East Third Street, G. H. HAZZARD, Agent.

In St. Louis, 112 North Fourth Street, C. SANDERS, Agent.

IN CHICAGO, at all Ticket Offices of the Chicago and Northwestern Railway.

C. F. HATCH, Gen'l Manager. A. H. BODE, Gen'l Pass. Agt

A. H. Kirk,

Manufacturer and Dealer in

Mill Furnishings.

PLANS AND SPECIFICATIONS MADE ON APPLICATION.

OFFICE and SHOPS, Cor. 6th Ave S. and 2d St.

MINNEAPOLIS, MINN.

$66 A WEEK in your own town, and no capital risked. You can give the business a trial without expense. The best opportunity ever offered for those willing to work. You should try nothing else until you see for yourself what you can do at the business we offer. No room to explain here. You can devote all your time or only your spare time to the business, and make great pay for every hour that you work. Women make as much as men. Send for special private terms and particulars, which we mail free. $5 outfit free. Don't complain of hard times while you have such a chance. Address H. HALLETT & CO., Portland, Maine.

RAILROAD TIME TABLES.

Chicago, Milwaukee & St. Paul R'y.

LEAVE MINNEAPOLIS.

Through Eastern and Southern express	*11:35 a m / $7:05 p m
Prairie du Chien, Milwaukee and Chicago express	*6:30 a m
Austin Mason City and Ottumwa express	*6:30 a m
Glencoe, Granite Falls and Montevideo express	*6:30 a m
St. Louis and Kansas City express	†8:20 p m
Sioux City and Omaha express	*2:50 p m
Owatonna accommodation	*4:10 p m

ARRIVE AT MINNEAPOLIS.

Through Eastern and Southern express	‡7:00 a m / §9:25 p m
Prairie du Chien, Milwaukee and Chicago express	*6:30 p m
Austin, Mason City and Ottumwa express	*6:30 p m
Glencoe, Granite Falls and Montevideo express	*6:30 p m
St. Louis and Kansas City express	‡7:00 a m
Sioux City and Omaha express	*12:40 a m
Owatonna accommodation	*9:30 a m

*Sunday excepted; †Saturday excepted; ‡Monday excepted; §Daily.

Chicago, Clinton, Dubuque & Minn. R. R.

GOING NORTH.

Chicago [C. & N-W Railway]	leave	10:30 a m	leave	9:15 p m
St. Louis [C. B. & Q. Ry.]	do	8:00 a m	do	8:45 p m
Rock Island	do	8:55 a m	do	9:40 p m
Clinton	do	3:17 a m	do	4:13 p m
Sabula	do	4:22 a m	do	5:19 p m
Bellevue	do	5:27 a m	do	6:24 p m
Dubuque	arrive	6:45 a m		
	leave	8:00 a m	arrive	7:29 p m
Guttenberg	do	10:05 a m		
McGregor	do	11:03 a m		
Waukon Junction	do	11:40 a m		
Lansing			leave	1:12 p m
Brownsville			do	2 40 p m
La Crosse			arrive	3:45 p m

GOING SOUTH.

La Crosse			leave	12:48 p m
Brownsville			do	1:50 p m
Lansing			do	3:15 p m
Waukon Junction			do	4:31 p m
McGregor			do	5:00 p m
Guttenburg			do	5:58 p m
Dubuque			arrive	7:41 p m
	leave	6:15 a m	leave	9:10 p m
Bellevue	do	7:26 a m	do	10:25 p m
Sabula	do	8:25 a m	do	11:20 p m
Clinton	arrive	12:40 a m	arrive	9:37 a m
Rock Island [C. B. & Q. Ry.]	do	5:00 a m	do	7:00 p m
St. Louis [C. B. & Q. Ry.]	do	7:15 a m	do	6:00 p m
Chicago [C. & N.W.]	do	7:15 a m	do	8:40 p m

Turkey River Branch.

Train leaves Wadena 6 a m; Turkey River 10.50 a m; arrives at Dubuque 1.20 p m. Leaves Dubuque 2.40 p m; Turkey River 5.10 p m; arrives at Wadena 9.40 p m.

Waukon & Mississippi R. R.

Trains leave Waukon at 8 a m and 2.15 p m; arrive at Wankon Junction at 10.25 a m and 4.30 p m. Leave Waukon Junction at 11.45 a m and 5 p m; arrive at Waukon at 12.40 p m and 7.30 p m.

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*Sundays excepted; †Daily; ‡Mondays excepted.

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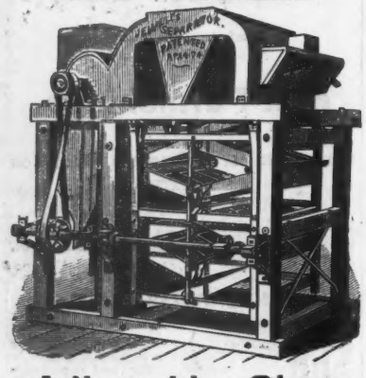

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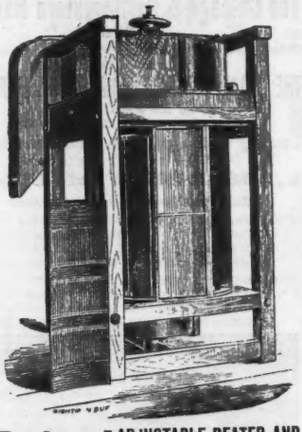

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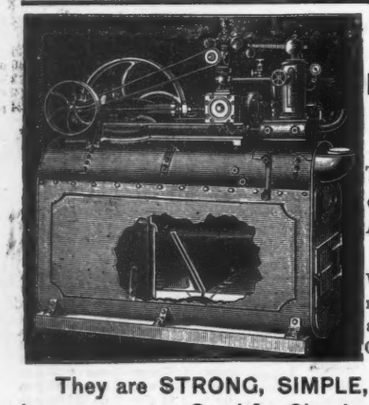

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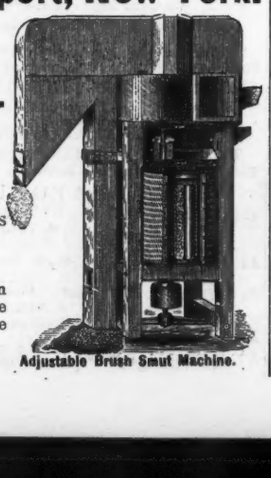

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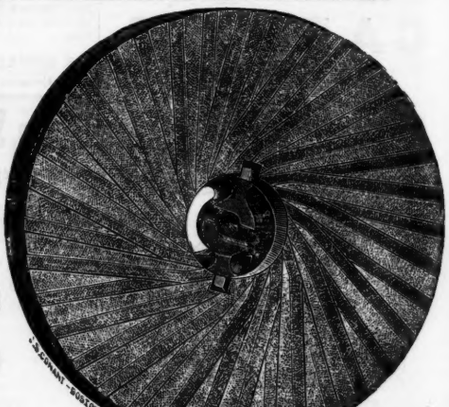

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